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ABSTRACT

This student learning guide contains 17 modules for completing a course in carpentry. It is designed especially for use in secondary schools in Palm Beach County, Florida. Each module covers one task, and consists of a purpose, performance objective enabling objectives, learning activities keyed to resources, information sheets, student self-check with answer key, performance test, instructional resources, and knowledge test. The 17 modules cover the following topics: layout and cutting of common rafters; layout and cutting of hip and valley rafters; using portable saws, portable electric routers, portable electric drills, table saws, portable electric power planes, and fasteners; followup applications and interviews; using band saws and scroll saws; erecting scaffolding; building sawhorses; using drilling and boring tools; identifying employment opportunities; measuring and squaring lumber; practicing safety; and using radial arm saws. (KC)

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STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY 9163

DUTY: 2 CUTTING AND INSTALLING FRAMING NUMBERS

TASK: 1 2 Layout and Cut a Common Rafter

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PURPOSE:

Most wood frame homes built today are in need of some kind of rafter to support the roof sheathing and finished roofing. Today the majority of wood frame homes have either what is known as a "gable roof" or a "hip roof" in either case common rafters are widely used. This learning guide will enable you to layout and cut a common rafter to meet building specifications.

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DUTY
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THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

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The format used in this student learning guide is one of the products developed through a grant from the Division of Vocational Education, Florida Department of Education which designated Ridge Vocational-Technical Center as a state demonstration site for competency-based vocational education.

OBJECTIVES PAGE 3 OF 11

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance,
and standard)

GIVEN:

access to the necessary tools, materials and plans,

YOU WILL:

layout and cut a common rafter.

HOW WELL:

You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify the steps in laying out a common rafter.
2. Practice cutting a common rafter using a portable power saw.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number PAGE 4 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective

Identify the steps in laying out a common rafter.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Read Resource No. 1 to determine tools and material needed to complete this task.	1. Instruction Sheet enclosed, <ins>Materials and Tools Needed to Layout and Cut a Common Rafter</ins>
2. Use Resource No. 2 to identify steps in laying out a common rafter.	2. a. Text: <ins>Framing, Sheathing and Insulation</ins>, pages 115-122. b. Kentucky Slides in Carrousel Cabinet: Box 14, CA-40-1.
3. Complete the Self-Check.	3. Self-Check enclosed.
4. When you think you can attain this task, take the Knowledge Test.	4. Knowledge Test.
5. Go on to Enabling Objective No. 2.	

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Materials and Tools Needed to Layout and Cut a Common Rafter

1. Blueprints of the house to be roofed
2. Framing square
3. Combination square
4. Sharp pencil
5. Pair of sawhorses
6. Portable power saw
7. Push pull steel tape, 16' 0"
8. 8pt. cross cut hand saw
9. Extension electric cord
10. Stock to be used for task (See instructor)

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DIRECTIONS:

Evaluate your knowledge by answering the items below on a separate sheet of paper.

1. A framing square is used to step off the rafter length.
2. The ridge cut is determined by using numbers on the tongue and body of the square to tie in with risp and run of building.
3. On the plan, 3/4" was deducted for 1/2 the thickness of the 2 x 10 ridge board.
4. More than 1/3 of the stock remains after the seat CVT was on the plumb end of the rafter.

Now check your answers with the Answer Key.

1. T
2. T
3. T
4. T

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All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 8 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice cutting a common rafter using a portable power saw.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment to cut a common rafter.	1. Instructor
2. Prepare a Job Plan Sheet. Have your instructor check your work.	2. Job Plan Sheet
3. Using Resource No. 3 practice cutting a common rafter.	3. a. Prepared Job Plan Sheet b. Tools c. Materials
4. When you think you can perform this task take the Performance Test.	4. Performance Test

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SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 9 OF 11

DUTY | TASK | EN. OBJ. | DEPT. | PROG.

DIRECTIONS:

Evaluate your work by answering the items below.
All items should receive a YES response.

	YES	NO
1. Were safety glasses worn?....................	____	____
2. Was length true to 1/8 of an inch?..........	____	____
3. Was crown of rafter on top side?.............	____	____
4. Was seat cut horizontal?.....................	____	____
5. Was building line cut plumb?.................	____	____
6. Was work area cleaned?.......................	____	____

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If you received a "NO" response for any item, go back and repeat one or more of the Learning Activities for this Enabling Objective.

PERFORMANCE TEST FOR 2 | 1 2

duty task number

PAGE 10 OF 11

DIRECTIONS:

Given access to tools and materials you will lay out and cut a common rafter. You will be evaluated for attainment of this task based upon the items below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were safety glasses worn?		
2. Was length true to 1/8 of an inch?		
3. Was crown of rafter on top side?		
4. Was seat cut horizontal?		
5. Was building line cut plumb?		
6. Was work area cleaned?		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

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KNOWLEDGE TEST FOR 2 duty 1 2 task number

PAGE 1 OF 1

DUTY

TASK

DEPT.

PROG.

TASK: Layout and Cut a Common Rafter

DIRECTIONS:

Evaluate your knowledge by answering the items below.
DO NOT WRITE ON THIS TEST!

1. Common rafters are used on a mansard roof.
2. Common rafters are cut in left or right pairs.
3. When cutting common rafters you must come out with an even amount of rafters.
4. In framing a hip roof some common rafters are used.
5. To lay out common rafters it is best to use a rafter square.

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2 - 12
Layout and Cut a Common Rafter
Answer Key

1. F

2. F

3. T

4. T

5. T

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

DUTY
TASK
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PROGRAM: CARPENTRY

DUTY: 2 CUTTING AND INSTALLING FRAMING MEMBERS

TASK: 1 3 Layout and Cut Hip and Valley Rafters

PURPOSE:

The hip rafter is a framing component used to frame a roof which has four sloping sides. It is used in conjunction with common rafters and jack rafters. This learning guide will teach you how to layout and cut a hip rafter.

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PERFORMANCE OBJECTIVE:

(Include condition, performance,
and standard)

GIVEN: access to the tools, materials and manuals,

YOU WILL: layout and cut a hip rafter.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify the steps in laying out and cutting a hip and jack rafter.
2. Practice cutting a hip rafter.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number

PAGE 4 OF 14

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective

Identify the steps in laying out and cutting a hip and jack rafter.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Read Resource No. 1 to identify tools and materials needed to perform this task.	1. Instruction Sheet enclosed, Tools and Materials Needed to Layout and Cut Hip and Jack Rafters
2. Read Resource No. 2 to identify steps in performing task.	2. Text: Roof Framing Carpentry, pages 256-259.
3. View Resource No. 3.	3. Kentucky Slides in Carrousel Cabinet: Box 14, CA-41-1.
4. Complete the Self-Check. When you think you can attain this task, take the Knowledge Test.	4. Self-Check enclosed.
5. Go on to Enabling Objective No. 2.	5. Knowledge Test.

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Tools and Materials Needed to Layout and Cut Hip and Jack Rafters

Tools

1. Pencil
2. Framing square
3. 16' 0" push pull tape
4. Combination square
5. Portable power saw

Materials

1. 8' 0" length of 2 x 4
2. 1 pair sawhorses
3. House plan

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. Hip rafters are used in a gable roof.
2. In order to layout a hip rafter you should use a rafter square.
3. In hip rafter layout the figure 12" on the framing square is ignored.
4. In a standard hip roof house there are 8 hip rafters.
5. Hip rafters and common rafters are always the same length.

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

PAGE 7 OF 14

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. F
2. T
3. T
4. F
5. F

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All of your answers should agree with the answer on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2

number

PAGE 8 OF 14

DUTY	TASK	EN. OBJ.	DEPT.	PROG.

Enabling objective:

Practice cutting a hip rafter.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for an assignment on cutting a hip rafter.	1. Instructor
2. Prepare a Job Plan Sheet. Have your instructor check your work.	2. Job Plan Sheet
3. Using Resource No. 3 practice cutting a hip rafter.	3. a. Prepared Job Plan Sheet b. Tools c. Materials
4. When you think you can perform this task, take the Performance Test.	4. Performance Test.

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Steps in Laying Out and Cutting a Hip Rafter

Follow same procedure as cutting a common rafter with these exceptions.

Points to Remember:

- In a common rafter 12" is used for the foot run.
- In a hip rafter 17" is used for the foot run.
- In a common rafter the ridge cut is made by a simple mitre cut.
- In a hip rafter the ridge cut is made by setting the SNW at a 45° angle and then making what is known as a compound mitre.
- Use 17" instead of 12" on the rafter square for the step off method.

Procedure

Study multi view drawing on the following page

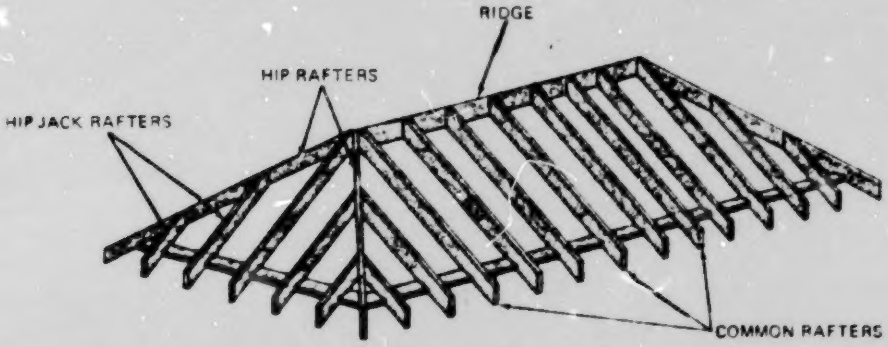

Figure 1 Members of a hip roof frame

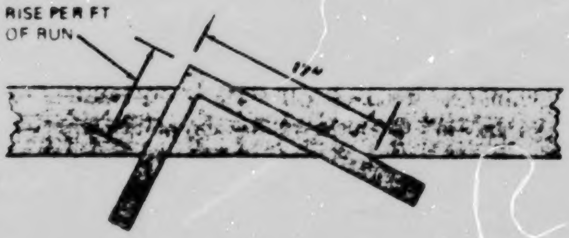

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Figure 2 The unit of run of the hip rafter is 17 inches.

Figure 3 Single Compound Mitre

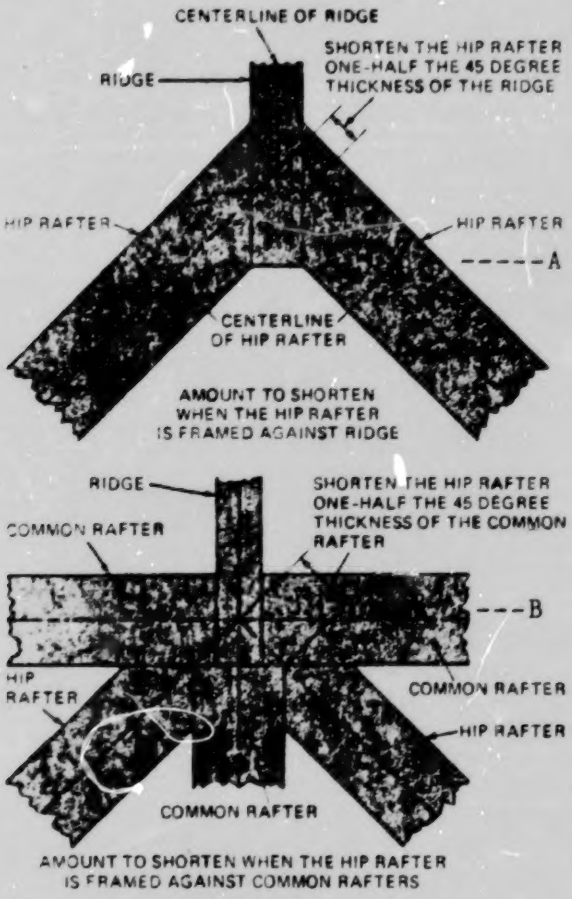
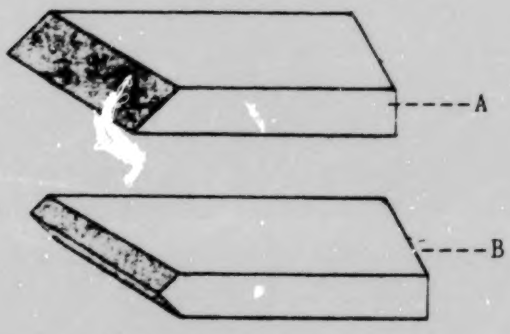

CENTERLINE OF RIDGE
RIDGE
SHORTEN THE HIP RAFTER ONE-HALF THE 45 DEGREE THICKNESS OF THE RIDGE
HIP RAFTER
HIP RAFTER
A
CENTERLINE OF HIP RAFTER
AMOUNT TO SHORTEN WHEN THE HIP RAFTER IS FRAMED AGAINST RIDGE
RIDGE
SHORTEN THE HIP RAFTER ONE-HALF THE 45 DEGREE THICKNESS OF THE COMMON RAFTER
COMMON RAFTER
B
HIP RAFTER
COMMON RAFTER
HIP RAFTER
COMMON RAFTER
AMOUNT TO SHORTEN WHEN THE HIP RAFTER IS FRAMED AGAINST COMMON RAFTERS

Figure 4 Double Compound Mitre



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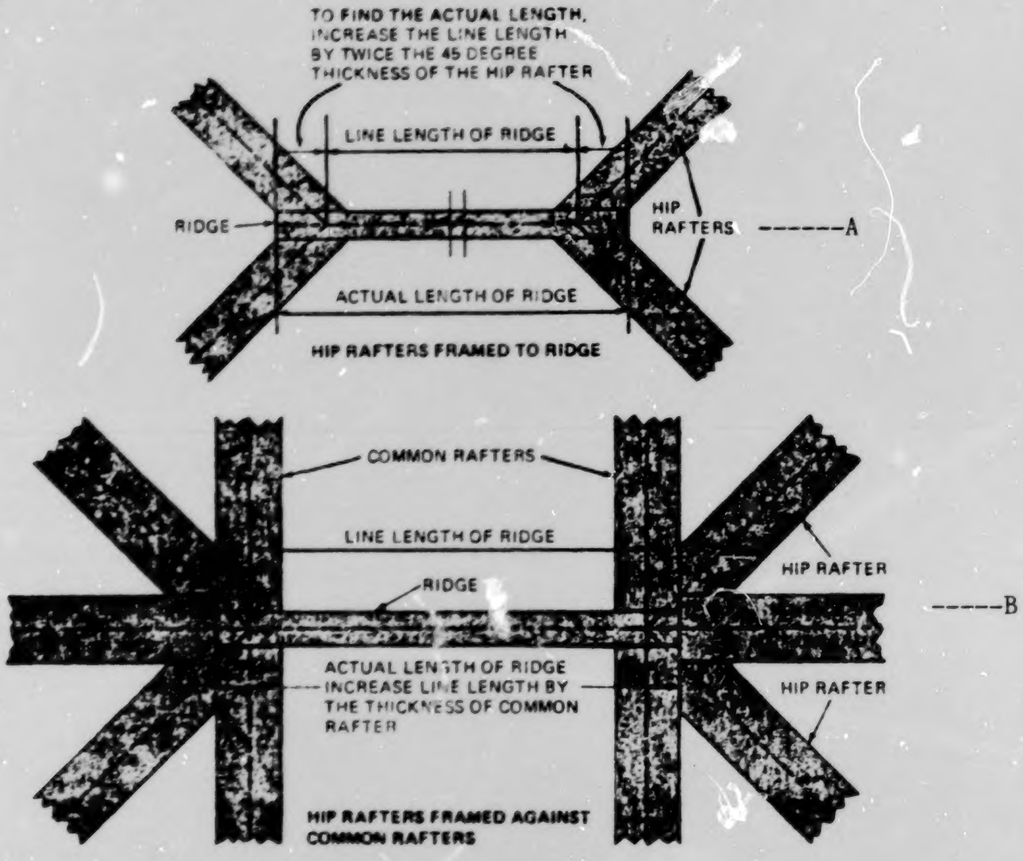
TO FIND THE ACTUAL LENGTH, INCREASE THE LINE LENGTH BY TWICE THE 45 DEGREE THICKNESS OF THE HIP RAFTER
LINE LENGTH OF RIDGE
RIDGE
HIP RAFTERS
------A
ACTUAL LENGTH OF RIDGE
HIP RAFTERS FRAMED TO RIDGE
COMMON RAFTERS
LINE LENGTH OF RIDGE
HIP RAFTER
RIDGE
-----B
ACTUAL LENGTH OF RIDGE INCREASE LINE LENGTH BY THE THICKNESS OF COMMON RAFTER
HIP RAFTER
HIP RAFTERS FRAMED AGAINST COMMON RAFTERS

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Figure 5 Actual length of the hip roof ridge for both methods of framing the hip rafter

SELF-CHECK FOR ENABLING OBJECTIVE 2

number

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DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by answering the items below. All items should receive a YES answer.

	YES	NO
1. Were safety glasses worn?..................	____	____
2. Was ridge cut in as marked at a 45° angle?.	____	____
3. Was length of rafters exact as designated by instructor?........,.....................	____	____
4. Was seat cut made so that no day light would show?....................................	____	____
5. Was work area cleaned and tools returned to the storage area?......................	____	____

If you received a "NO" response for any item go back and repeat one or more of the Learning Activities for this Enabling Objective.

PERFORMANCE TEST FOR 2 | 1 3

duty task number

PAGE 13 OF 14

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

DIRECTIONS:

Given access to tools and supplies, you will layout and cut a hip rafter. You will be evaluated for attainment of this task based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were safety glasses worn?		
2. Was the length correct to within 1/8"?		
3. Was seat cut of proper bearing (3 1/2" +)?		
4. Was ridge cut true?		
5. Was rafter crowned?		
7. Were all tools returned to storage area?		

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Instructional Resources

Text

Lewis, Gaspar, Roof Framing Carpentry, (Book is out of print).

KNOWLEDGE TEST FOR 2 duty 1 3 task number PAGE 1 OF 1

DUTY | TASK | DEPT. | PROG.

TASK: Layout and Cut Hip and Valley Rafters

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below.
DO NOT WRITE ON THIS TEST!

1. Hip rafters support common rafters.
2. Hip rafters support jack rafters.
3. Hip rafters run 90° to ridge pole.
4. Hip rafters are always nailed with 8d finish nails.
5. When working with hip rafters you should think of right an left cuts.
6. Hip rafters are an integral part of mansard roofs.
7. If you know how to layout and cut a common rafter then you know how to lay out and cut a hip rafter.

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2 - 13

Layout and Cut Hip and Valley Rafters
Answer Key

1. F

2. T

3. F

4. F

5. T

6. F

7. F

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 1 3 Use Portable Saws

PURPOSE:

The development of the portable power saws has help increase efficiency and reduce physical exertion. You must be able to use this tool in order to get a job as a carpenter.

This learning guide will help you learn proper use of the various portable power saws.

DUTY
TASK
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THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

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DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to power saws and materials,

YOU WILL: use power portable saws.

HOW WELL: You must successfully complete the Knowledge Test.

Your performance will be assessed, by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify portable circular saws and their uses.
2. Identify reciprocating and sabre saws and their uses.
3. Practice using portable power saws.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number PAGE 4 OF 18

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

enabling objective

Identify portable circular saws and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify portable circular saws and their uses.	1. a. Text: Woodworking Tools, Materials, Processes, Section 5, Chapter 39, "Portable Circular Saws" pages 384-390, b. Manual: Black & Decker Owner's Manual - # 7390 7 1/4 saw. c. Instruction Sheet enclosed, Saw Safety Rules
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

SAW SAFETY RULES

GENERAL.

1. KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.

2. DO NOT OPERATE portable electric tools in gaseous or explosive atmospheres. Motors in these tools normally spark, and sparks might ignite fumes.

3. AVOID DANGEROUS ENVIRONMENT. Don't expose power tools to rain. Don't expose power tools to rain. Don't use power tool in damp or wet locations. And keep work area well lit.

4. WEAR PROPER APPAREL. No loose clothing or jewelry to get caught in moving parts. Rubber gloves and footwear are recommended when working outdoors.

5. USE SAFETY GLASSES. Also face or dust mask if cutting operation is dusty.

6. DON'T ABUSE CORD. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil and sharp edges.

7. SECURE WORK. Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool. Small pieces should always be clamped.

8. DON'T OVERREACH. Keep proper footing and balance at all times.

9. MAINTAIN TOOLS WITH CARE. Keep tools sharp, at all times, and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

10. AVOID ACCIDENTAL STARTING. Don't carry plugged-in tool with finger on switch. Be sure switch is off when plugging in.

11. OUTDOOR USE EXTENSION CORDS. When tool is used outdoors, use only extension cords suitable for use outdoors and so marked.

SPECIFIC

1. DISCONNECT PLUG from power supply before changing blades, making cutting depth or cutting angle adjustments, inspecting, cleaning or when saw is not being used.

2. Make sure the teeth of the blade are sharp and set correctly. Dull blades may cause the saw to swerve or stall under pressure.

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Use the correct blade for the work to be done.

3. Never make an adjustment on a saw when it is running.

4. Don't stand directly in line with the saw blade. If the blade binds, it may kick the saw back out of the cut. If this happens, turn off the switch immediately.

5. Always keep the guard in place and the blade adjusted for the correct depth of cut. NEVER TIE BACK the lower blade guard or its retracting lever.

6. WHEN RETRACTING the lower blade guard, always use the retracting lever on the guard.

7. IF YOU DROP OR DAMAGE the saw, unplug it first; then check to see if the blade and lower blade guard operate freely before resuming operations.

8. NEVER REMOVE the lower guard spring for any reason. If spring should become damaged, replace spring before attempting to use the saw.

9. PERIODICALLY check lower guard for correct operation retracting & return.

10. KEEP HANDS AWAY from cutting area. Never reach underneath the material for any reason.

11. Allow the saw to reach full speed before starting a cut.

12. Keep the cord away from the cutting area.

13. Do not reach under the stock while cutting.

BLADE CHANGING

1. Disconnect the power source to change a blade. Make sure that the teeth are pointing in the direction of rotation and that the arbor nut is tight.

2. PERIODICALLY check clamp washer, spindle bolt, spindle, and saw blade mounting hole for damage.

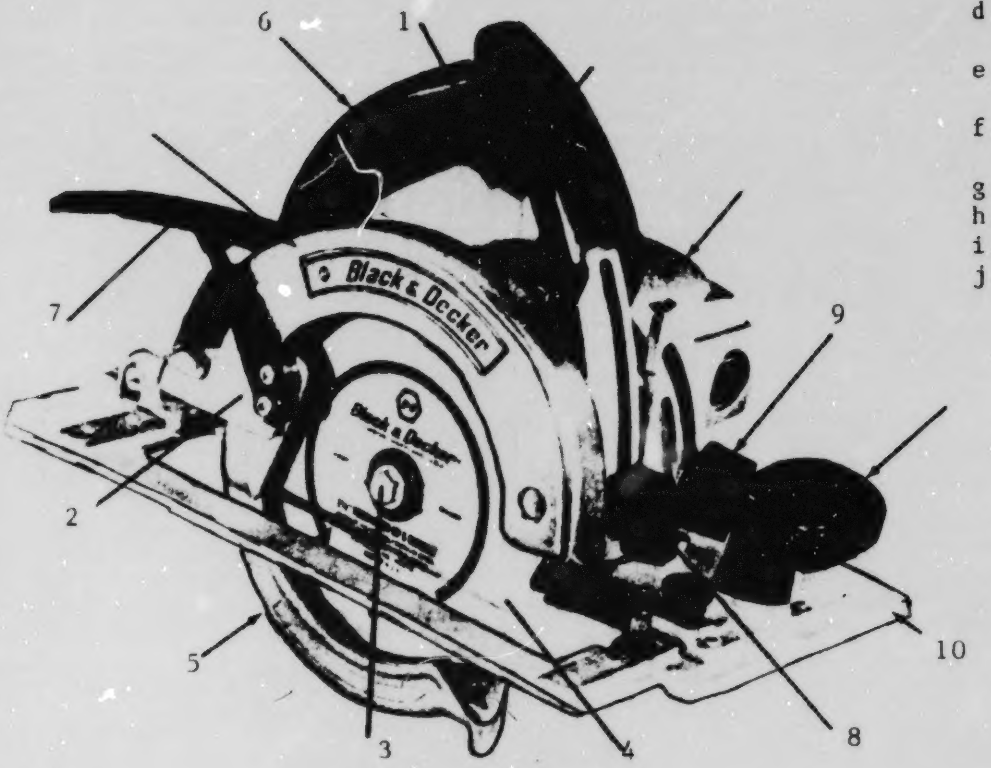
3. NEVER use a defective or substitute clamp washer of spindle bolt for mounting blade.

4. NEVER use blades with incorret size mounting hole in relation to spindle size.

5. REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.

DIRECTIONS:

Evaluate your knowledge by completing the items below on a separate sheet of paper.



a. power cord
b. retractable guard
c. retractable handle
d. blade clamping screw
e. angle adjustment knob
f. depth adjustment knob
g. base plate
h. switch
i. handle
j. blade

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Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

11. Tools should always be carried with a finger on the switch.

12. Changing blades with the saw plugged in saves time and is a good safety practice.

13. Never adjust a running saw.

14. Avoid using power tools around gases or other explosive materials.

15. Always check to see that all tools used in changing saw blades were removed before using the tool.

16. If you lose a clamp washer or apindle belt, a substitute may be selected from the regular belt bin.

17. If you drop a saw, unplug it and check for damage before using it.

18. A person can safely "tie-back" the retractable guard for certain cutting operations.

19. When cutting plywood, reach underneath the piece being cut and check for complete blade penetration.

20. Saws should be lowered from a roof by the cord.

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

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DUTY

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1. h
2. c
3. d
4. j
5. b
6. i
7. a
8. f
9. e
10. g

11. False
12. False
13. True
14. True
15. True
16. False
17. True
18. False
19. False
20. False

All answers should agree with the answer on Answer Key. If you missed any, go back and repeat one or more of the Learning Activities of this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2

number

PAGE 10 OF 18

Enabling objective:

Identify reciprocating and sabre saws and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify reciprocating and sabre saws and their uses.	1. a. Instruction sheet enclosed, Reciprocating and Sabre Saw Safety Rules b. Text: Modern Carpentry, Unit 2, pages 29-31. c. Text: Carpentry and Building Construction, Unit 15, pages 192-196 d. Text: Woodworking Tools, Materials, Processes, Section 5, Unit 40, pages 391-397.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test.
4. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 3.	

DUTY

TASK

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DEPT.

PROG.

Reciprocating and Sabre Saw Safety Rules

Before cutting:

1. Always check grounding devices on both saw and extention cord.
2. Be sure switch is in off position before attaching to power source.
3. Keep the cord away from the cutting area.
4. Be sure that the work is well supported and that you are not cutting into saw horses or other supports.
5. With the saw unplugged check the blade to see that it is the proper one for the cut; sharp, and securely fastened in the chuck.
6. Disconnect the saw from the power source before changing blades.

During cutting:

1. Securely hold long stock, or clamp short stock, and keep hands outside the 4" safety area. Keep the base of the saw securely on the stock when cutting.
2. Turn on the motor before the blade contacts the stock, do not "force" the saw faster than it can confortably cut, and after turning the saw off, allow it to come to a complete stop before removing it from the cut or setting it down.
3. Do not attempt to cut curves so sharp that the blade will be twisted.
4. Do not make a plunge cut, with a sabre saw, in stock more than 1/4" thick.

Instruction Sheet prepared by James R. Kidd.

DIRECTIONS:

Evaluate your knowledge by answering the items below using a separate sheet of paper.

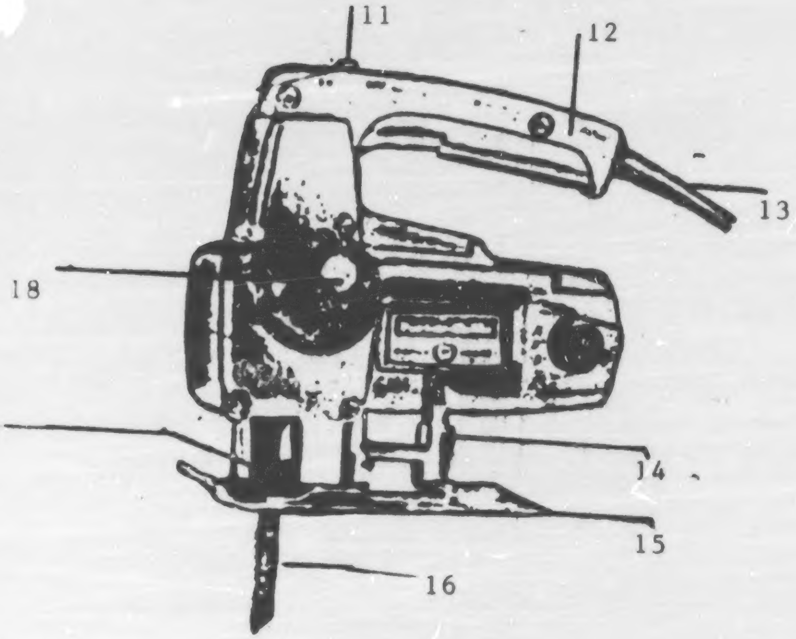
1. Sabre saws should be disconnected from the power source before blades are changed.
2. Blades with 10 teeth per inch are satisfactory for general purpose work.
3. If the stock is not securely held or supported, the blade may break.
4. The base of some saws may be adjusted from 0° - 45° for level cutting.
5. Sabre saw blades are installed with the teeth facing forward.
6. A sabre saw cuts on the upward saw.
7. When cutting paneling, plywood, or other materials which chip easily, the best side should be kept facing down.
8. Relief cuts should be made when cutting small curves.
9. Hands should be kept out of the 4 inches safety margin.

10 An adjustable up guide is used to rip long lines where accuracy is desired.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number
CONTINUED

PAGE 13 OF 18

DUTY
TASK
EN. OBJ.
DEPT.
PROG.



a. tilting base
b. handle
c. blade
d. off-on switch
e. cord strain reliever
f. blade screw
g. guide knob
h. bevel locking screw

Now check your answers with the Answer Key.

1. True
2. True
3. True
4. True
5. True
6. True
7. True
8. True
9. True
10. True
11. d
12. b
13. e
14. h
15. a
16. c
17. f
18. g

All your answers should agree with the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3

number

PAGE 15 OF 8

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using portable power saws.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a job plan sheet for this assignment. Have your instructor check your Job Plan Sheet.	2. Job Plan Sheet
3. Using Resource No. 3 practice using the framing square.	3. a. Job Plan Sheet prepared. b. Tools c. Materials
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor inspect your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 3

number

PAGE 16 OF 18

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by answering the items below. All items should receive a "YES" response.

	YES	NO
1. Were safety measures followed at all times?.........	___	___
2. Was the proper saw and blade chosen for each job?...	___	___
3. Was the work securely held while cutting?...........	___	___
4. Were short pieces of stock clamped in such a way as to be securely held?...........................	___	___
5. Were the straight cutting lines followed accurately?	___	___
6. Were the curved cutting lines followed accurately?..	___	___
7. Was the saw "bound" or faced while cutting?.........	___	___
8. Was proper care exercised to prevent cutting the power cord or other undesirable items?.............	___	___

If you received a "NO" response for any item, go back and repeat one or more of the Learning Activities for this Enabling Objective.

PERFORMANCE TEST FOR C | 1 | 3

duty task number

PAGE 17 OF 18

DIRECTIONS:

Given access to a work station, materials, and tools, you will use portable power saws. You will be evaluated for the attainment of this task, based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were safety measures followed at all times?........		
2. Was the proper saw and blade chosen for each job?........		
3. Was the work securely held while cutting?........		
4. Were short pieces of stock clamped in such a way as to be securely held?........		
5. Were the straight cutting lines followed accurately?........		
6. Were the curved cutting lines followed accurately?........		
7. Was the saw "bound" or faced while cutting?........		
8. Was proper care exercised to prevent cutting the power cord or other undesirable items?........		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

Instructional Resources

Text

Feirer, J. L., Hutchings, G. R., Carpentry and Building Construction, Charles A. Bennet Co., Inc.,Peoria, ILL 1981.

Spencer, W. P., Griffiths, D. L., Woodworking, Tools, Materials, Processes, American Technical Publishers, Alsip, ILL 1981.

Wagner, W. H. Modern Carpentry, Goodhart - Wilcox Co., Inc., South Holland, ILL 1979.

KNOWLEDGE TEST FOR C | 1 3
duty | task number

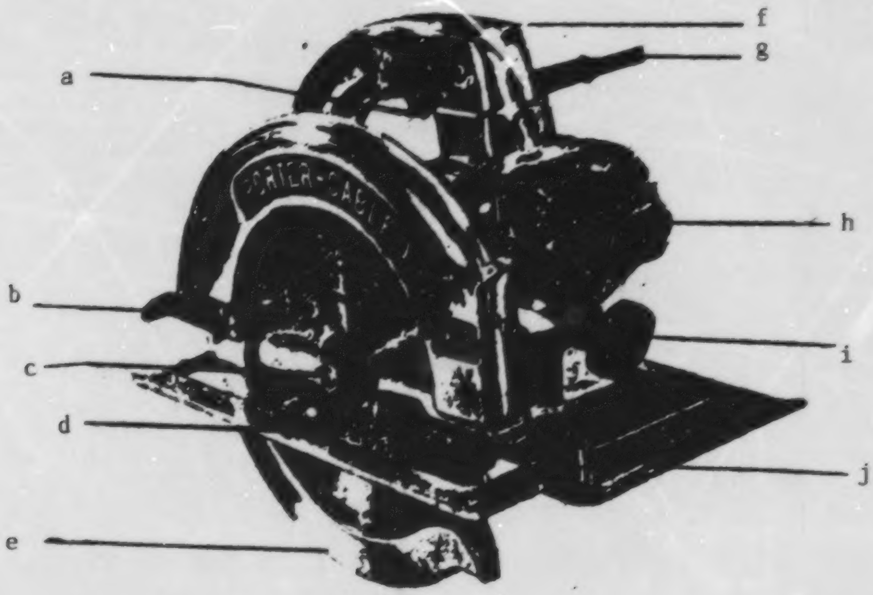
PAGE 1 OF 2

DUTY	TASK	DEPT.	PROG.

TASK: Use portable power saws.

DIRECTIONS: Evaluate your knowledge by matching the items below using a separate sheet of paper.

1. Power cord
2. Retractable guard
3. Guard retracting handle
4. Blade clamping screw
5. Angle adjusting knob
6. Depth adjustment knob
7. Base plate
8. Switch
9. Handle
10. Blade



KNOWLEDGE TEST FOR C 1 3

CONTINUED duty task number PAGE 2 OF 2

DUTY

TASK

DEPT.

PROG.

11. Bevel locking screw

12. Guide knob

13. Blade screw

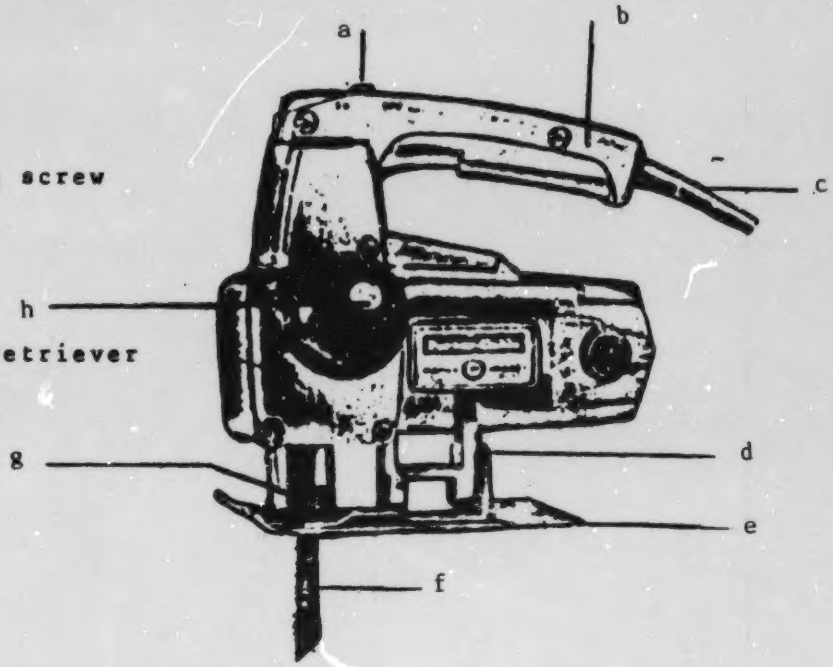
14. Cord strain retriever

15. Off-On switch

16. Blade

17. Handle

18. Tilting base



Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

19. Always disconnect a saw from the power source before changing blades.

20. Hands should be kept outside a safety margin of 4 inches in any direction from the blade.

21. Short stock should always be clamped before cutting.

22. Blades should be kept sharp, the proper blade used for each job, and the saw should never be forced through the work.

23. Never carry a tool with your finger on the switch.

24. Never carry or lower a tool by the power cord.

25. A rip guide is used for making long, straight cuts parallel to the side of the stock.

COMPLETING CORE CURRICULUM
Use Portable Power Saws
C-13

1. g
2. e
3. b
4. c
5. i
6. h
7. j
8. a
9. f
10. d
11. d
12. h
13. g
14. c
15. a
16. f
17. b
18. e
19. True
20. True
21. True
22. True
23. True
24. True
25. True

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: ☐ ☐ Measure and Square Lumber

PURPOSE:

Squaring stock is the process of working all the surfaces of the stock until they have been made smooth and true, until they are at right angles to the adjoining surfaces, and until opposite surfaces are parallel to each other. It is the fundamental basis of all woodworking.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY

TASK

PREREQ.

DEPT.

PROG.

REVISED

THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

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Riviera Beach, Florida 33404

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The format used in this student learning guide is one of the products developed through a grant from the Division of Vocational Education, Florida Department of Education which designated Ridge Vocational-Technical Center as a state demonstration site for competency-based vocational education.

OBJECTIVES PAGE 3 OF 7

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to a square, stock, pencil, and tape or rule,

YOU WILL: measure, and square lumber.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify the steps in measuring and squaring lumber.
2. Practice measuring and squaring lumber.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 4 OF 7

Enabling objective:

Identify the steps in measuring and squaring lumber.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1	1. a. Text: Units in Woodworking, pages 40-42. b. Demonstration
2. As a Self-Check your instructor will question you orally.	2. Instructor
3. Go on to Enabling Objective No. 2.	

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2
number

PAGE 5 OF 7

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Enabling objective:

Practice measuring and squaring lumber.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Using Resource No. 1 practice squaring and measuring lumber.	1. a. rule/tape b. square c. stock d. pencil
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number

PAGE 6 OF 7

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by answering the items below using a separate sheet of paper.
All items should receive a "YES" response.

	YES	NO
1. Was the length measured using a rule?.........	____	____
2. Was the square held so that the body was snug against the stock?........................	____	____
3. Was the pencil held at a 30° angle and rotated to draw the line?.................	____	____
4. Was the pencil pulled across the stock?.......	____	____
5. Were the edges of the stock marked so that a continuous line was formed (all four sides)?	____	____

ERFORMANCE TEST FOR ☐ ☐☐

duty task number

PAGE 7 OF 7

RECTIONS:

Given access to a pencil, square, rule/tape and stock, you will measure and square lumber.
Your performance will be assessed by your instructor using the Performance Test.

ERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Was the length measured using a rule?....................		
2. Was the square held so that the body was snug against the stock?....................		
3. Was the pencil held at a 30° angle and rotated to draw the line?....................		
4. Was the pencil pulled across the stock?....................		
5. Were the edges of the stock marked so that a continuous line was formed (all four sides)?....................		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 1 6 Use Portable Electric Routers

DRAFT

PURPOSE: Development of the portable electric router has enabled the carpenter to perform millworking operations which could only be accomplished before in the factory or shop. It has also replaced many hand operations, such as cutting rabbets with a rabbet plane, mortising dear butts, or trimming plastic laminate. This Learning Guide will assist you in the development of skills necessary for safe router operation.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY
TASK
PREREQ
DEPT.
PROG.
REVISED

THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

North Technical Education Center
7071 Garden Road
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JAMES R. KIDD, CARPENTRY INSTRUCTOR
WEST TECHNICAL EDUCATION CENTER

The format used in this student learning guide is one of the products developed through a grant from the Division of Vocational Education, Florida Department of Education which designated Ridge Vocational-Technical Center as a state demonstration site for competency-based vocational education.

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to portable electric router and materials

YOU WILL: use portable electric routers.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test on page 10.

ENABLING OBJECTIVES:

1. Identify portable electric routers and their uses.
2. Practice using portable electric routers.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 4 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify portable electric routers and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify safety rules for router operation.	1. Instruction Sheet enclosed, Router Safety
2. Use Resource No. 2 to identify routers and their uses.	2. a. Text: Woodworking, Tools, Materials, Processes, Section 5, Unit 42, "Routers", pages 401-418. b. Text: Carpentry and Building Construction, Unit 13, "Router and Electric Plane", pages 176-183. c. Text: Woodworking for Industry, Unit 37, "Router", pages 410-416.
3. Complete the Self-Check.	3. Self Check enclosed.
4. When you think you can attain this task, take Knowledge Test.	4. Knowledge Test.
5. When you have successfully completed the Knowledge Test go on to Enabling Objective No.2	

Router Safety

1. Wear safety glasses.
2. Unplug the cord when changing bits.
3. If the router is equipped with a chuck locking device, be sure it is unlocked before returning the tool to service after the bit is changed.
4. Clamp small stock to a work bench.
5. Hold the router securely by both handles.
6. Never reach underneath the stock to support it.
7. Take only light cuts to prevent overloading the tool.
8. Move the router counter clockwise when cutting.
9. Do not rest the router against your body.
10. Be sure the fence, guides and depth adjustment are securely clamped.
11. Always lay the tool down with the cutter away from you, and be alert for the coasting cutter.
12. Be sure the switch is in the off position before plugging the machine into an outlet.
13. Made adjustments only after the cutter has completely stopped.

Instruction Sheet prepared by James R. Kidd.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 6 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by matching the items below on a separate sheet of paper.

1. A router consists of a
2. The bit is held by a
3. Rabbets are cut with
4. Grooves are cut with
5. Moving the motor up and down in the base controls the depth of the
6. Controlling the sideways movement of the router is accomplished with the
7. A rounded edge is shaped with
8. A 45° bevel edge is produced with a
9. How far should a bits shank be inserted in the chuck?
10. The most popular size bit shank used in a portable electric router is

a. straight bits
b. rabbeting bits
c. collet chuck
d. guide
e. rounding over bit
f. motor and base
g. cut
h. 1/2"
i. 1/4"
j. chamfer bit

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. f
2. c
3. b
4. a
5. g
6. d
7. e
8. j
9. h
10. i

All answers should agree with the answer on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities of this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 8 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using portable electric routers.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your Job Plan Sheet.	2. Job Plan Sheet
3. Using Resource No. 3, practice using the router.	3. a. Prepared Job Plan Sheet. b Tools c. Materials
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor check your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 9 OF 11

DUTY | TASK | EN. OBJ. | DEPT. | PROG.

DIRECTIONS:

Given access to tools and materials you will use portable electric routers. You will be evaluated for your attainment of this task based upon the items listed below.

		YES	NO
1.	Were the correct bits selected for each operation?................................	____	____
2.	Were the bits properly installed?........	____	____
3.	Was the router moved in such a way that the direction of feed was against motor rotation?....................................	____	____
4.	Was the router securely held at all times?.....	____	____
5.	Was the stock securely held at all times?......	____	____
6.	Was the router moved faster than it could cut without overloading the motor?.............	____	____
7.	Was the depth adjusted to prevent overloading?....................................	____	____
8.	Were safety rules strictly observed at all times?	____	____

If you received a "NO" response for any item go back and repeat one or more of the Learning Activities for this Enabling Ocjective.

PERFORMANCE TEST FOR C | 1 | 6

duty task number

PAGE 10 OF 11

DIRECTIONS:

Given access to work station, materials, bits and a router, you will use a portable electric router. You will be evaluated for attainment of this task, based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were the correct bits selected for each operation?..........		
2. Were the bits properly installed?..........		
3. Was the router moved in such a way that the direction of feed was against motor rotation?..........		
4. Was the router securely held at all times?..........		
5. Was the stock securely held at all times?..........		
6. Was the router moved faster than it could cut without overloading the motor?..........		
7. Was the depth adjusted to prevent overloading?..........		
8. Were safety rules strictly observed at all times?..........		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained

☐ Not attained

EVALUATOR

DEPT.

PROG.

KNOWLEDGE TEST FOR C | 1 6

duty task number

PAGE 1 OF 1

DUTY

TASK

DEPT.

PROG.

TASK: Use portable electric routers.

DIRECTIONS:
Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. A guide is used to control sideways movement of the router.
2. Rounding over bits produces square edges.
3. Depth of cut is controlled by moving the motor up and down in the base.
4. Straight bits are used to cut grooves.
5. Chamfer bits produce a 45° edge cut.
6. About 1/2" of the bits shank should be inserted in the collet chuck.
7. 1 1/4" diameter bit shanks are the most common.
8. Rabbet bits are used to cut Roman Ogees.
9. A router consists basically of a motor and a base.
10. The bit is attached to the motor by the collet chuck.

C-16

COMPLETING CORE CURRICULUM
Use Portable Electric Routers

1. True
2. False
3. True
4. True
5. True
6. True
7. False
8. False
9. True
10. True

7

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 1 4 Use Portable Electric Drills

PURPOSE:

The portable electric drill is one of the most popular carpentry tools because of its many accessories and variety of uses. It is second only to the portable power saw among the tools most often used in general carpentry. This learning guide will assist you in attaining the knowledge and skill to safely use the drill and accessories.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to portable electric drills, accessories, and materials,

YOU WILL: use portable electric drills.

HOW WELL: You must successfully complete the Knowledge Test.

Your performance will be assessed by your instructor using the Performance Test on page 11.

ENABLING OBJECTIVES:

1. Identify portable electric drills and their uses.
2. Practice using portable electric drills.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number

PAGE 4 OF 12

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Enabling objective

Identify portable electric drills and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify safety practices for portable electric drills.	1. Instruction Sheet enclosed, Portable Electric Drill Safety Rules
2. Use Resource No. 2 to identify portable electric drills and their uses.	2. a. Text: Woodworking: Tools, Materials, Processes, Section 5, Unit 43, pages 419-422. b. Text: Carpentry and Building Construction, Unit 14, "Portable Electric Drill," pages 186-191. c. Text: Woodworking for Industry, Section D, Unit 40, "Power Drilling and Boring," pages 428-434.
3. Complete the Self-Check.	3. Self-Check enclosed.
4. When you think you can attain this task, take the Knowledge Test.	4. Knowledge Test
5. When you successfully complete the Knowledge Test, go on to Enabling Objective No. 2.	

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 1 number PAGE 5 OF 12

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Portable Electric Drill Safety Rules

1. Always unplug the drill before changing bits.
2. Be certain the drill is clamped securely in the chuck.
3. Always remove the chuck key immediately after installing the bit.
4. Never use a square tang (hand brace type) bit in an electric drill.
5. Never stop a "coasting" drill with your hand.
6. Always lay a drill down with the bit pointing away from you and not before it has stopped coasting.
7. Never face the drill - use a steady, even pressure.
8. Always clamp small work before drilling. DO NOT hold steel in your hand.
9. Keep the cord clear of the drilling area.
10. Keep fingers and clothes away from the drill bit. Never drill in cloth or carpet.
11. Grip the drill with both hands to maintain control.
12. When drilling very thin metal, use a "backing block" and be careful. The thin metal causes the bit to have a tendency to "grab" as it breaks through the metal. It may cause you to drop the drill or hurt your arm.
13. Always wear safety glasses when drilling.
14. Avoid touching metal drill shavings, as they may be hot and burn you, or may cut your hands.

Instruction Sheet prepared by James R. Kidd.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 6 OF 12

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering the items below on a separate sheet of paper.

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. Metal drill shavings may burn or cut you.
2. When drilling hard materials, a drill may be forced.
3. Unplug a drill before changing bits.
4. Square tang bits slip less in the drill and are safer to use than standard bits.
5. Small stock should be hand held while being drilled.
6. Drills should be held with both hands, whenever possible, while drilling.
7. A "backing block" should be used when drilling thin metal.
8. Masonry bits work very well on carpet.
9. Coasting drills may be stopped with the hand.
10. Remove the chuck key immediately after changing the bit.
11. Portable electric drill sizes are determined by the size of the chuck.
12. The largest drill bit that may be used in a 3/8" drill is 3/8 inch in diameter.
13. Drill bits should be checked for straightness before installation in the drill.
14. Just enough pressure should be applied to a drill to keep it cutting.
15. Variable speed drills make good power screwdrivers.
16. Circle and hole cutters work best in portable drills.
17. The center of each hole should be marked with a center punch or scratch awl before drilling.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 9 OF 12

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using portable electric drills.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your work.	2. Job Plan Sheet
3. Using Resource No. 3, practice using the portable electric drill.	3. a. Prepared Job Plan Sheet b. Drill and accessories c. Materials
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor check your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

PAGE 8 OF 12

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. True
2. False
3. True
4. False
5. False
6. True
7. True
8. False
9. False
10. True
11. True
12. True
13. True
14. True
15. True
16. False
17. True
18. True
19. f
20. b
21. c
22. d
23. a
24. g
25. h
26. e

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

Enabling objective

Practice using portable electric drills.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your work.	2. Job Plan Sheet
3. Using Resource No. 3, practice using the portable electric drill.	3. a. Prepared Job Plan Sheet b. Drill and accessories c. Materials
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor check your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 10 OF 12

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

DIRECTIONS:

Evaluate your work by answering the items below.
ALL items should recive a "YES" response.

	YES	NO
1. were the bits checked for straightness before installation?...	___	___
2. Was the chuck key inserted, used, and removed according to instructions?..	___	___
3. Was steady, even pressure used on the drill?.................	___	___
4. Was the drill held securely at all times?....................	___	___
5. Was the student able to use the drill as a power screwdriver?.	___	___
6. Was the student able to select different drill sizes?.........	___	___
7. Was the stock supported during drilling according to instructions?..	___	___
8. Was the stock securely held at all times?....................	___	___
9. Were safety precautions followed at all times?................	___	___

If you received a "NO" response for any item, go back and repeat one or more of the Learning Activities for this Enabling Objective.

Instructional Resources

Feirer, John S. and Hatchings, Gilbert R., Carpentry and Building Construction, Charles A. Bennett Company, Inc., Peoria, IL, 1981.

Feirer, John S., Woodworking for Industry, Charles A. Bennett Co., Inc., Peoria, Illinois, 1979.

Spencer, William P. and Griffiths, Duane, Woodworking, Tools, Materials, Processes, American Technical Publishers, Alsip, Illinois, 1981.

KNOWLEDGE TEST FOR C | 1 4
duty | task number

PAGE 1 OF 1

DUTY
TASK
DEPT.
PROG.

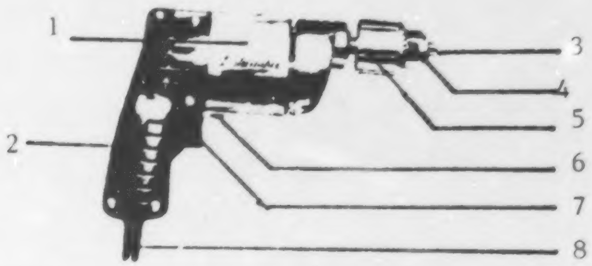
TASK: Use Portable Electric Drills

DIRECTIONS:

Evaluate your knowledge by answering the items below.

DO NOT WRITE ON THIS TEST!

Evaluate your knowledge by matching the items on the right with the diagram. Use a separate sheet of paper.



a. pistol grip handle
b. motor housing
c. chuck keyhole
d. cord strain reliever
e. chuck
f. reverse switch
g. chuck jaws
h. off-on switch

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

9. Variable speed drills make good power screwdrivers.
10. Most 1/4" drills have a pistol-grip handle.
11. The largest drill bit that may be used in a 3/8" drill is 3/8 inch in diameter.
12. The chuck key should be removed from the chuck immediately after changing a bit.
13. Whenever possible, drills should be held with both hands.
14. Masonry bits work very well on carpet.
15. Never force a drill.
16. "Coasting" drills may be stopped with one hand.
17. A "backing block" should be used when drilling thin metal.
18. Small stock should be hand held while drilling.
19. Unplug the drill before changing bits.
20. Bits should be checked for straightness before being installed in the drill.

C-14

Answer Key

Use Portable Electric Drills

1. b
2. a
3. g
4. c
5. e
6. f
7. h
8. d
9. True
10. True
11. True
12. True
13. True
14. False
15. True
16. False
17. True
18. False
19. True
20. True

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 1 8 Use Table Saws

PURPOSE:

Speed and accuracy make the table saw the most popular of all stationary power tools. New, light-weight, high speed saws have made table-saws more portable than ever before. Once considered a shop tool, they are now commonly in use on most construction jobs. This Learning Guide will instruct you in the safe operation of a table saw.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(include condition, performance, and standard)

GIVEN: access to table saws and resource materials,

YOU WILL: use table saws.

HOW WELL: you must successfully complete the Knowledge Test.

Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify safe table saw operating practices.
2. Identify common operations that may be performed with a table saw.
3. Practice using table saws.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number PAGE 4 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify safe table saw operating procedures.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify table saw safety practices.	1. Instruction Sheet enclosed, Table Saw Safety Practices
2. Use Resource No. 2 to identify table saw operation.	2. Text: a. Carpentry and Building Construction Unit II, "Circular Saw",pages 148-157 (up to special cuts). Text: b. Woodworking for Industry, Unit 30 "Circular Saw", pages 344-351. Text: c. Woodworking, Tools, Materials, Processes Unit 28, "Table Saws", pages 232-246, (up to sewing after a pattern).
3. Use Resource No. 3 to identify table saw component parts.	3. Text: Fundamentals of Carpentry, Chapter 4, "Carpentry Tools, Part II" page 86, Figures 4-22 & 4-23.
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Go on to Enabling Objective No. 2.	

Table Saw Safety Practices

1. Ask permission to use table saw.

2. Wear protective eye devices.

3. Saw only clean, nail free lumber.

4. Select proper blade, make sure it is sharp, clean, and properly installed.

5. Check operation of guards. Ask your teacher for assistance if setup requires removal of guards.

6. Use ripping fence or miter gauge. Do not use both except with a clearance block as directed by your teacher.

7. Never saw "freehand" that is, without some guiding device.

8. Stand to one side rather than in line with the blade.

9. Use push sticks for stock under 6 inches width.

10. Push stock yourself. Use a helper to bear off, but instruct him to only support the stock, not pull it.

11. Blade should not project over 1/8 inch above work.

12. Use support stands for long boards.

13. Never reach over the saw.

14. Feed rapidly enough to make saw work. Don't jam stock into blade. Don't feed so slowly as to cause burning.

15. Return adjustments to normal and clean up the saw and area after the machine has stopped.

16. Remove tie, rings and wrist watch, and roll up your sleeves.

17. Remove any loose knots or nails. Care must be taken with warped or twisted boards that do not lie flat on the table, they must be cut or they may kick back.

18. Be sure the work area is cleared of loose material that might cause tripping or falling. Be sure the saw table is clear of scraps. (The saw table is cleaned with a brush when the saw is not running. The power controls must be locked in an OFF position when brushing.)

19. Never reach over or lift stock over the saw when it is running.

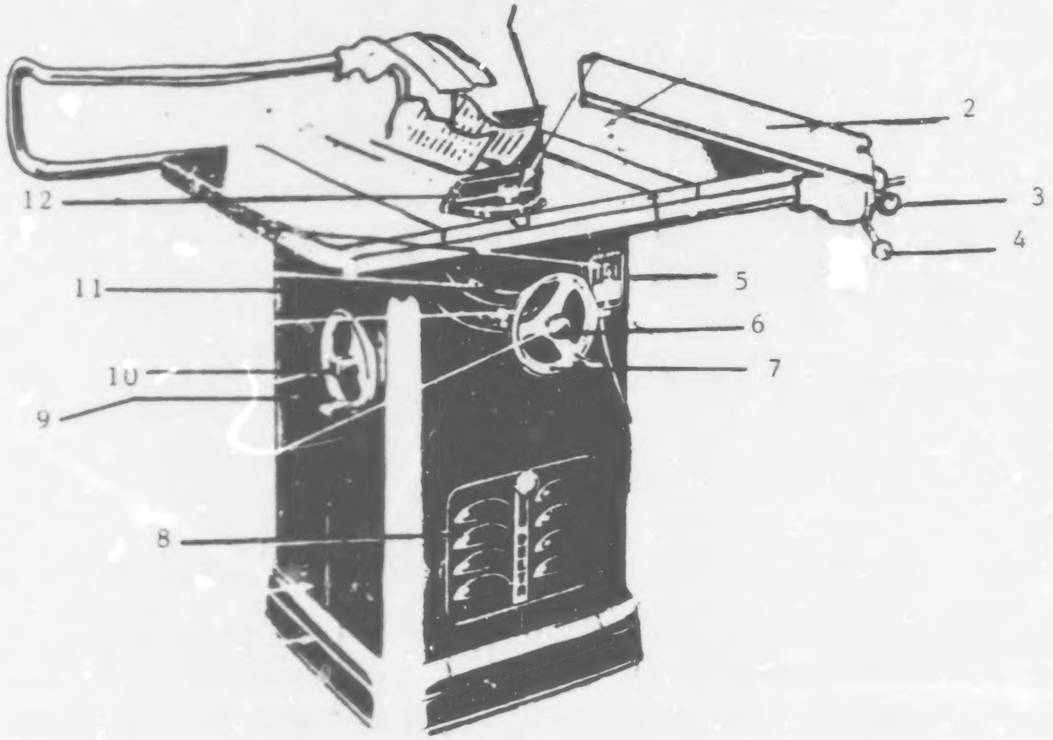
20. Do not place your hands in front of or over running blade. Keep the hands a safe distance from the blade. The left hand can be used to hold the stock against the fence and the bed of the table saw.

21. Do not cut cylindrical stock on the table saw.

22. Check the setup before turning on power.

DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.



a. micro knob set

b. switch

c. saw raising handwheel

d. saw raising lock knob

e. saw tilt handwheel

f. saw tilt lock knob

g. fence clamp

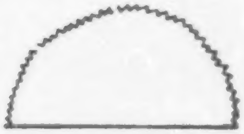
h. sawdust clean-out

i. blade guard (uniguard)

j. fence

k. saw tilt scale

l. miter gauge

13


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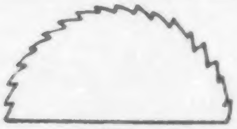

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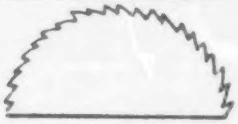

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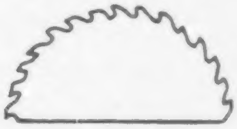

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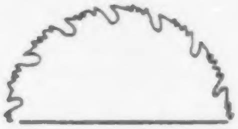

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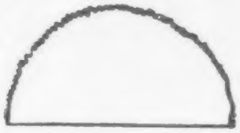

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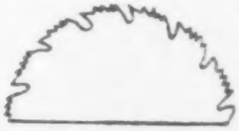

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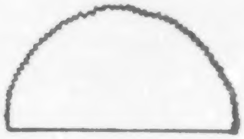

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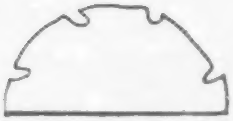

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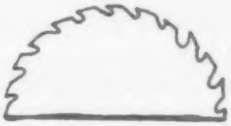


m. carbide tipped blade

n. planer combination

o. planer combination-hollow ground

p. plywood blade

q. plywood blade-hollow ground

r. multi-toothed carbide tipped

s. cut-off blade

t. all-purpose combination

u. chisel tooth combination

v. rip blade

Choose a letter from the above list which best matches the following .

23. fast cutting across grain

24. fast cutting with the grain

25. paneling

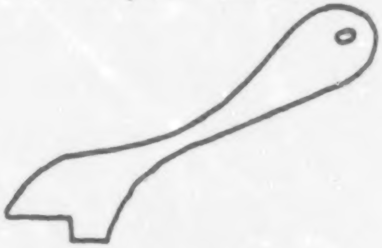
26. general purpose cutting

27. longer-lasting blade used for cutting hard materials

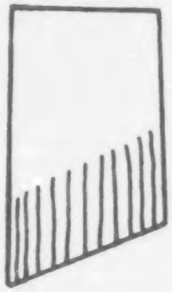
28. smooth cross-cutting or ripping

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

29. Is the item below a push stick?



30. Is the item below a featherboard?



Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

PAGE 10 OF 17

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

1. i
2. j
3. a
4. g
5. b
6. d
7. c
8. h
9. e
10. f
11. k
12. l
13. s
14. v
15. t
16. u
17. n or o
18. p or q
19. n or o
20. p or q
21. m
22. r
23. s
24. v
25. p
26. t
27. m or r
28. n
29. True
30. True

All the answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 11 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective

Identify common operations that may be performed with a table saw.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify common operations.	1. a. Text: Carpentry and Building Construction, Unit 11, "Circular Saw", pages 157-165. b. Text: Woodworking for Industry, Unit 30, "Circular Saw", pages 351-365. c. Text: Woodworking, Tools, Materials, Processes Unit 28, "Table Saws", pages 246-261.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test.
4. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 3.	

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. Jointing cuts should be made with a crosscut, hollow-ground, or combination blade.

2. A rabbet may be cut by making two cuts with a saw blade, or by using a dado head.

The miter should be cut to one of the following degrees:

3. 4 sided figure is 45°

4. 5 sided figure is 54°

5. 6 sided figure is 65°

6. 8 sided figure is 67 1/2°

7. 10 sided figure is 75°

8. Grooves may be cut by the same methods as rabbets.

9. Wabble-washers correct warped blades.

10. Dado heads require use of a special throat plate.

11. Compound miter cuts are used for picture frames.

12. Extension tables make cutting plywood easier.

13. Jigs are required to cut wedges and tapers.

14. Resawing is a ripping operation.

15. A dado runs across the grain of the wood.

16. Molding heads may be used on table saws.

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 2
ANSWER KEY
number

PAGE 13 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. True
2. True
3. True
4. True
5. False
6. True
7. False
8. True
9. False
10. True
11. True
12. True
13. True
14. True
15. True
16. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3

number

PAGE 14 OF 17

DUTY

TASK

E.N. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using table saws.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your Job Plan Sheet.	2. Job Plan Sheet.
3. Use Resource No. 3 to practice using the table saws.	3. a. Job Plan Sheet. b. Materials c. Table Saw
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor inspect your work.	5. Instructor
6. When you think you can perform this task take the Performance Test.	6. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 3 number PAGE 15 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by completing the items below using a separate sheet of paper.

All items should receive a "YES" response.

	YES	NO
1. Were proper safety practices followed at all times?................................	____	____
2. Was the saw set-up according to instructions for the rip assignment?.......	____	____
3. Was the saw set-up according to instructions for the cross-cutting assignment?.............................	____	____
4. Was the push stick used for narrow rips?...	____	____
5. Was the feather board used when required?..	____	____
6. Were miters figured and cut?..............	____	____
7. Was the saw set up according to instructions and used to cut a:		
a. plough................................	____	____
b. dado	____	____
c. rabbet................................	____	____
8. Were blade-changing procedures followed?...	____	____
9. Were various blades identified?...........	____	____
10. Were major parts of the saw identified?....	____	____

PERFORMANCE TEST FOR ☐ ☐☐

duty task number

PAGE 16 OF 17

DIRECTIONS:

Given access to a work station, materials and a table saw, you will demonstrate your ability to use table saw. You will be evaluated for the attainment of this task based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were proper safety practices followed at all times?..		
2. Was the saw set-up according to instructions for the rip assignment?..................................		
3. Was the saw set-up according to instructions for the cross-cutting assignment?.........................		
4. Was the push stick used for narrow rips?................		
5. Was the feather board used when required?............		
6. Were miters figured and cut?............................		
7. Was the saw set up according to instructions to cut a:		
a. plough..		
b. dado		
c. rabbet..		
8. Were blade-changing procedures followed?...............		
9. Were various blades identified?.........................		
10. Were major parts of the saw identified?................		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained

☐ Not attained

EVALUATOR

DEPT.

PROG.

KNOWLEDGE TEST FOR C | 1 8
duty | task number

PAGE 1 OF 2

DUTY

TASK

DEPT.

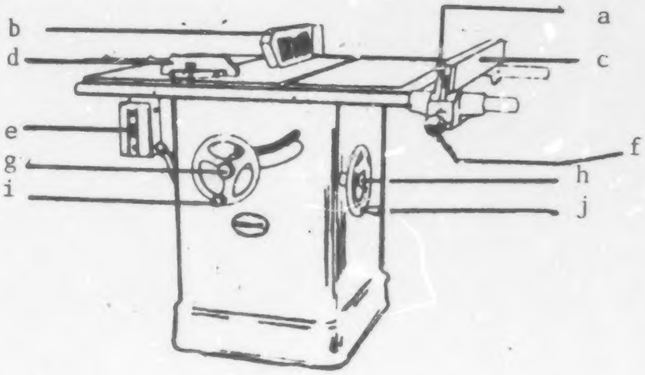
PROG.

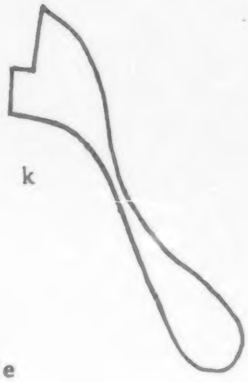
TASK: Use table saws

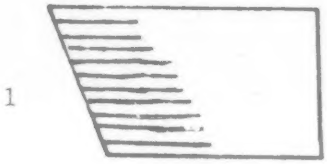
DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.

1. Fence
2. Miter gauge
3. Tilt lock knob
4. Tilt lock knob
5. Saw raising wheel
6. Raising wheel lock
7. Guard
8. Micro-knob set
9. Fence clamp
10. Switch
11. Carbide tipped blade
12. Planer combination
13. Feather board
14. Push stick
15. Chisel tooth combination blade
16. Plywood blade

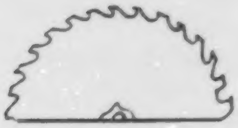


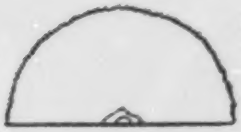


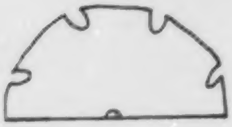


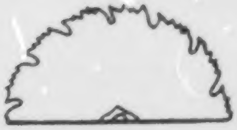
KNOWLEDGE TEST FOR C 1 8
ONTINUED duty task number PAGE 2 OF 2

DUTY
TASK
DEPT.
PROG.

m 

n 

o 

p 

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

17. Safety glasses should be worn when in the vicinity of an operating table saw.

18. Never stand directly behind the table saw's when it is being used.

19. All scraps should be removed from the table immediately after the blade has stopped turning.

20. A ten sided figure would require miter cuts of 72°.

21. Wabble washers enable the cutting of grooves with a regular saw blade.

22. A special throat plate is required for dado heads.

23. Disconnect the saw from the power source before changing the blade.

24. Rabbets may be cut by making two cuts with a standard blade.

25. Jigs are used to cut wedges and tapers.

BEST COPY AVAILABLE

C-18
Answer Key
Use Table Saws

1. c
2. d
3. h
4. j
5. i
6. g
7. b
8. f
9. a
10. e
11. o
12. p
13. l
14. k
15. m
16. n
17. True
18. True
19. True
20. True
21. True
22. True
23. True
24. True
25. True

BEST COPY AVAILABLE

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 1 7 Use Portable Electric Power Planes

PURPOSE: Although not one of the tools most commonly used by carpenters, the portable power plane is a valuable time saver. This learning guide will help you develop skills necessary for using portable power planes.

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

BEST COPY AVAILABLE

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY	TASK	DEPT.	PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to portable power planes and materials,

YOU WILL: use portable power planes.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test on page 10.

ENABLING OBJECTIVES:

1. Identify portable power planes and their uses.
2. Practice using portable power planes.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number PAGE 4 OF 11

Enabling objective:

Identify portable power planes and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify plane safety rules.	1. Instruction Sheet enclosed, Power Plane Safety
2. Use Resource No. 2 to identify portable power planes and their uses.	2. a. Text: Woodworking, Tools, Materials Processes. Unit 41 "Portable Power Planes", pages 398-400. b. Text: Fundamentals of Carpentry, Chap. 4 "Carpentry Tools-Part II", pages 107-109. c. Text: Woodworking for Industry, Unit 36, "Hand or Power Plane", pages 408-409.
3. Complete the Self-Check.	3. Self-Check enclosed.
4. When you think you can attain this task, take the Knowledge Test.	4. Knowledge Test.
5. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 2.	

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Power Plane Safety

1. Be sure the switch is in "Off" position before connecting the plane to the power source.
2. Unplug the cord when making adjustments or changing cutters.
3. Keep the cord away from the cutting area.
4. Clamp small pieces securely, and never reach under stock to support it.
5. Be sure material being planed is free of nails or other metal.
6. Hold the plane securely by the handle and motor housing.
7. Remove tie, wrist watch and rings, and roll up sleeves before using a power plane.
8. Pay attention: Keep your full attention on the work.
9. Never remove more than 1/16 inch of material at one time.
10. Keep pressure constant - don't overload the plane.
11. When the cut is finished, turn off the power switch, and wait until the motor stops before setting the plane down.
12. When the work is completed, disconnect the tool from the power source.

BEST COPY AVAILABLE

Instruction Sheet prepared by James R. Kidd.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 6 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

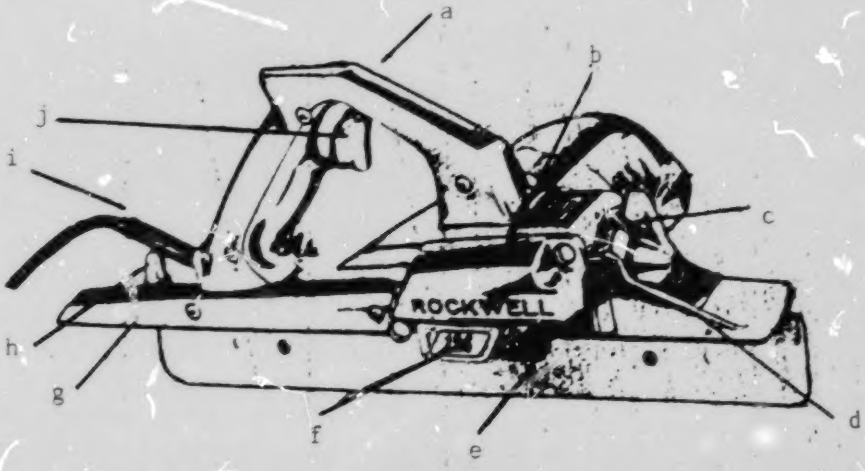
Evaluate your knowledge by answering the items below using a separate sheet of paper.

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. Power planes are able to finish surfaces up to about 2½" wide.
2. Power block planes are designed for one-handed operation.
3. The bottom of the plane is called the bed.
4. The fence prevents the plane from getting out of the tool box.
5. The tilt adjustment controls the depth of the cut.
6. The depth adjustment controls the angle of the cut.
7. Carbide cutters are available for cutting hard materials, such as formica.

Evaluate your knowledge by matching the items below using a separate sheet of paper.

8. cord deflector
9. guard
10. D-handle
11. trigger switch
12. cord strain reliever
13. depth adjustment
14. front shoe
15. rear shoe
16. chip reflector
17. fence



Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1
ANSWER KEY
number

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. True
2. True
3. True
4. False
5. False
6. False
7. True
8. h
9. b
10. a
11. j
12. i
13. c
14. d
15. g
16. f
17. e

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 8 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using portable power planes.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your Job Plan Sheet.	2. Job Plan Sheet
3. Use Resource No. 3 to practice using portable power planes.	3. a. Job Plan Sheet. b. Tools c. Materials
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor check your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 9 OF 11

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by completing the items below using a separate sheet of paper.
All items should receive a "YES" response.

		YES	NO
1.	Were all safety procedures strictly followed?..		
2.	Was the plane adjusted to cut 1/16 inch or less?..		
3.	Were both hands used to hold the tools?......		
4.	Was the stock cut to the specified dimensions?.		
5.	Was the bed of the plane identified?....		
6.	Was the fence of the plane identified?.....		
7.	Were angle adjustments accurately made?......		
8.	Were depth adjustments accurately made?......		

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

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PERFORMANCE TEST FOR C | 1 | 7

duty task number

PAGE 10 OF 11

DIRECTIONS:

Given access to a work station, materials and portable power planes, you will use a portable power plane. You will be evaluated for attainment of this task based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT

	YES	NO
1. Were all safety procedures strictly followed?		
2. Was the plane adjusted to cut 1/16 inch or less?		
3. Were both hands used to hold the tools?		
4. Was the stock cut to the specified dimensions?		
5. Was the bed of the plane identified?		
6. Was the fence of the plane identified?		
7. Were angle adjustments accurately made?		
8. Were depth adjustments accurately made?		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained

☐ Not attained

EVALUATOR

DEPT.

PROG.

Instructional Resources

Texts

Spencer, W. P., Griffiths, L. D., Woodworking, Tools, Materials Processes, American Technical Publishers,Alsip, IL. 1981

Feirer, J. S., Hatchings, G. R., Carpentry and Building Construction, Charles Bennett Co., Inc., Peoria, IL. 1981.

Feirer, J. S. Woodworking for Industry, C. A. Bennet Co., Inc. Peoria, IL. 1979.

C-17

COMPLETING CORE CURRICULUM
Use portable power planes

1. True
2. True
3. True
4. True
5. True
6. True
7. True
8. c
9. i
10. d
11. j
12. g
13. a
14. f
15. b
16. e
17. h

KNOWLEDGE TEST FOR C | 1 7

duty | task number

PAGE 1 OF 1

DUTY

TASK

DEPT.

PROG.

TASK: Use portable power planes.

DIRECTIONS:

Evaluate your knowledge by answering the items below using a separate sheet of paper.

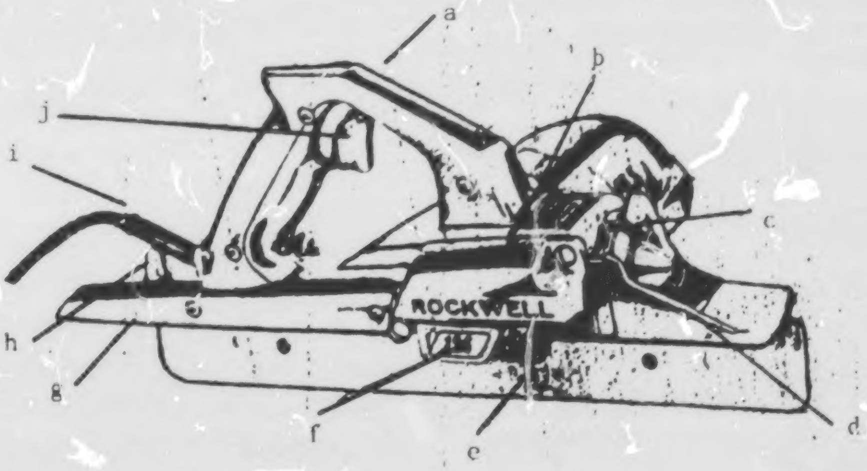
DO NOT MARK ON THIS TEST!

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. Power planes are able to finish surfaces up to about 2½" wide.
2. Power block planes are designed for operation with one hand.
3. The bottom of the plane is called the bed.
4. The fence guides the plane along the board.
5. The tilt adjustment controls the angle of the cut.
6. The depth adjustment controls the amount of material to be cut away on each pass.
7. Formica is cut with a carbide cutter.

Evaluate your knowledge by matching the items below using a separate sheet of paper.

8. depth adjustment
9. cord strain reliever
10. front shoe
11. trigger switch
12. rear shoe
13. D-handle
14. clip reflector
15. guard
16. fence
17. cord deflector



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STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 1 1 Use Fasteners

PURPOSE:

Fasteners are appliances which hold objects together. A carpenter must be familiar with variations of fasteners since his work is not simply limited to wood or nails. This learning guide will instruct you in both, the different types of fasteners and their uses.

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

PLEASE DO NOT WRITE IN LEARNING GUIDE

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OBJECTIVES

PAGE 3 OF 43

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:

(Include condition, performance, and standard)

GIVEN: access to tools and materials,

YOU WILL: use fasteners.

HOW WELL: You must successfully complete the Knowledge Test. Your peformance will be evaluated by your instructor using the Performance Test on page 42.

ENABLING OBJECTIVES:

1. Identify nails and their uses.
2. Identify screws and their uses.
3. Identify masonry fasteners and their uses.
4. Identify bolts and nuts used in carpentry.
5. Practice using fasteners.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 4 OF 43

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify nails and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to learn about nails and their uses.	1. a. Text: Basic Carpentry, Chapter 4, pages 63-68. b. Instruction Sheet enclosed, Holding Power of Nails c. Instruction Sheet enclosed, Cut Nails [illegible]. Instruction Sheet enclosed, Selecting Nails for a Job. e. Instruction Sheet enclosed, Nailing
2. Complete the Self-Check.	
3. Go on to Enabling Objective No. 2.	

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Holding Power of Nails

The holding power of a nail depends on its size, shape, and surface treatment. The pressure of the wood fibers in contact with the surface of the nail also affects the holding power. Wood fibers are compressed and displaced from their original location when the nail is driven. The tendency of these fibers to spring back to their original location builds a pressure against the surface of the nail. It also increases the holding power even on smooth surface nails. Hardwood fibers give greater pressure than softwood fibers.

To increase their holding power, nails are barbed, grooved or coated, or are made with shanks of different shapes, Figure 1. Nails can be barbed either their full lenght or partially, near the head. Fully barbed nails are desirable in shorter lengths since less nail is being used to provide holding power. Grooved nails are grooved for their full length, either with longitudinal or spiral-type grooves. As the nail is driven into the wood, fibers are compressed into the grooves holding the nail more firmly. Coated nails give more holding power by the adhesive action of the coating between the nail and the wood fibers. The coating also prevents rust.

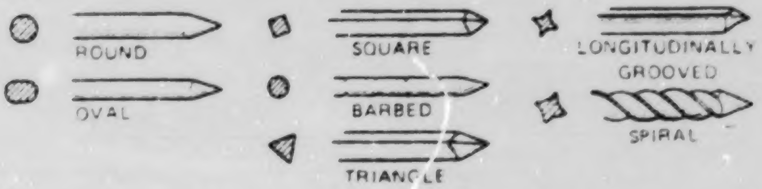

Figure 1 - Types of shanks.

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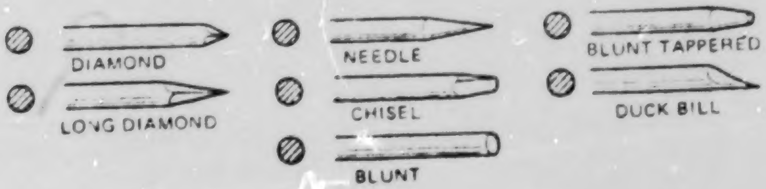

Figure 2 - Types of nail points.

The point of the nail, Figure 2, also contributes to its holding power. In general, nails having long points have greater holding capacity. Points which are blunt have less tendency to split the work.

Nails are prepared with various shaped heads, to suit specific job needs. Generally, nails with broad heads have greater holding power.

Cut Nails

Cut nails are made from iron or steel with a tapered rectangular shaped shank. The head and point are also rectangular in shape. The blunt point punches out a hole to get the nail started. It does not tend to wedge the wood fibers apart and cause splitting as would a pointed wire nail.

Cut nails have good holding power and are often specified as a fastening for flooring. They come in lengths similar to those of the common wire nails.

To avoid splitting the wood when driving a cut nail, the straight side should be placed in the wood parallel with the grain so that the tapered edges of the nail act as a wedge in the direction which is less likely to cause splitting. See Figure 1.

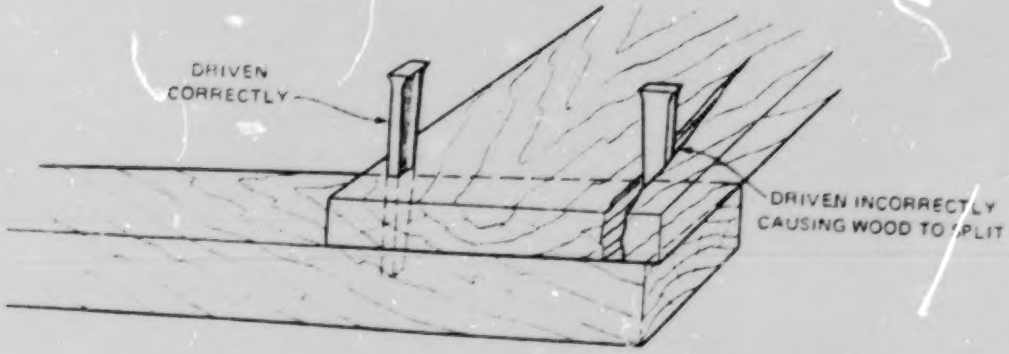

Figure 3 - Driving cut nails.

Note: Although similar in appearance, these nails should not be confused with case-hardened masonry nails. They are not tempered, and will not satisfactorily drive into masonry.

Selecting Nails for a Job

Nails used for framing a building must have strength and holding power. The common nail is strong and has good holding power.

Two-thirds of the length of the nail body must penetrate the lower piece of wood. The upper third of the nail should be in the top member. The flat head adds greatly to the holding power of the top third of the nail. More strength is needed to pull the head and the one-third length of the nail through the top piece of the lumber than to pull the two-thirds of the nail length through the bottom piece. See Figure 1.

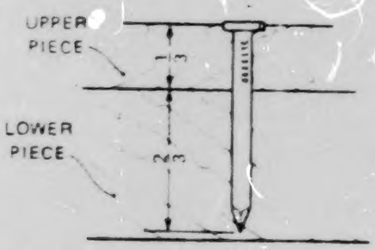

Figure 3 - Division of nail length in wood.

When selecting nails for a job, these points should be considered.

- The type of material which is to be nailed.
- The strain to which the nailing will be subjected.
- The conditions, weather and otherwise, to which the nail will be exposed.
- The appearance of the finished job.

When all of these factors have been considered, the length, gauge, and type of nail to select is then determined. When nailing special-type materials, refer to the manufactorer's literature for recommended fastening devices and techniques.

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Improved Nails

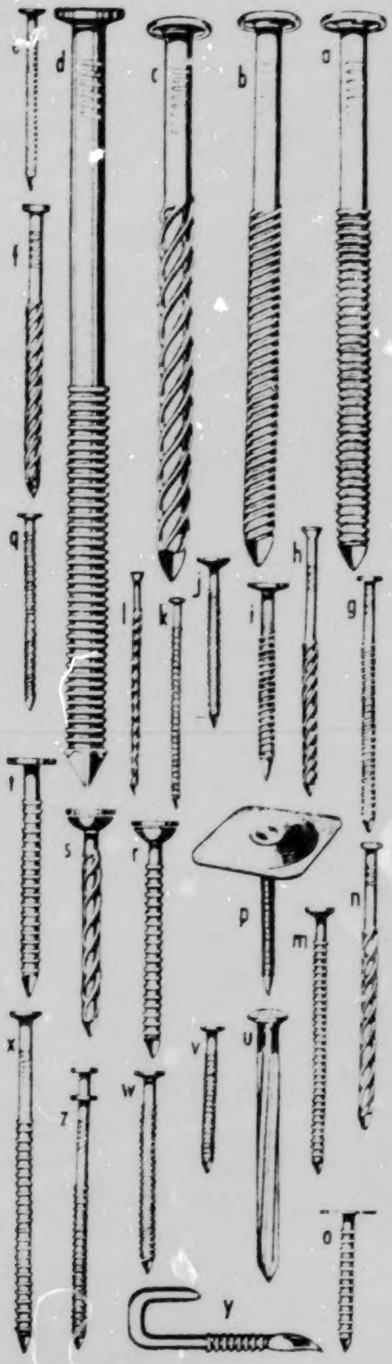
Today in construction many improved forms of the wire nail are used. Changes in nail forms have come about with the development of new types of building materials. Some new materials require special fastening devices.

Warping and shrinking are two things that affected the holding power of nails in the past. However, laminates, composition boards, and various types of synthetics have reduced the occurrence of warping and shrinking. Elimination of such problems also created new problems which have made it necessary for improved nail forms.

Improved nails, sometimes referred to as thread nails, are basically the same as the conventional form nail. They differ in that a portion of the nail shank is threaded with annular or helical threads, and in some instances, is heat treated (hardened or tempered).

The deep, full annular or helical threads along the nail shank provide dents into which the wood fibers can penetrate. Thus, both frictional and shear resistance are provided to nail withdrawal.

An improved nail can be compared in shape to a common wood screw. As with the wood screw, a section just beneath the head is left unthreaded to provide clearance for the shank. Because of this, it can rotate in the top wood member and thus draw the wood members together.



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Selecting Improved Nails For a Job

The improved nail, Figure 2, has greater holding power, and thus can be used to obtain the same holding power that the larger common nail provides. It can be driven more easily and used in places where the larger nail can split the wood.

Nailing

Always nail from a thin piece into a thick piece (Figure 3-A) as this results in greater nail holding power. Whenever possible, drive nails across grain rather than into end grain. Nails driven into end grain have less holding power.

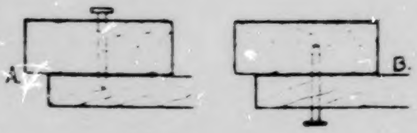

Figure 3 - (A) Correct method of nailing. (B) Incorrect method of nailing.

When locating nails, do not drive them too close together or in line with another. Stagger them as in Figure 4. The result of driving nails in line with one another is shown in Figure 5. Space out the nails so that the holding power is distributed over a wide area. Do not nail close to an edge.

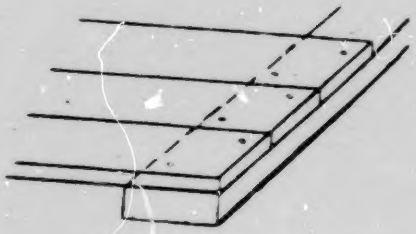

Figure 4 - Nails correctly spaced and staggered.

When there is danger of splitting a board, use nails of a smaller gauge, or drill holes about three-fourths of the diameter of the nail partially through the board before driving. To prevent splitting in thin boards, cut the nail points off with nippers or pliers. The points thus prepared are less likely to cause splitting.

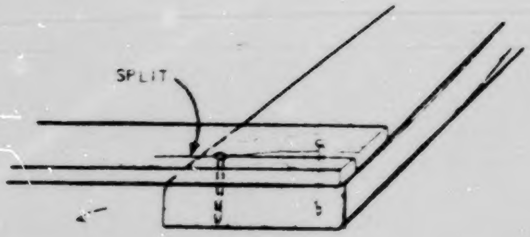

Figure 5 - Nails driven in line causing splitting.

When driving flathead nails in soft texture materials, such as composition sheathing and wood shingles, do not drive the head below the surface. Finish driving the nail with a light blow that brings the head flush with the surface. To make nailing easier in hardwood, dip the point of the nail in beeswax or soap.

When driving aluminum nails, use the same procedure as in driving common nails, but careful not to strike the nails with heavy blows as the nails bend easily. It is sometimes better to drill holes for this type of nail, especially where the wood is hard. Aluminum and coated nails are more expensive than steel nails and therefore particular care should be exercised when using them.

NOTE: If a nail bends, draw it out and start a new one in its place. If this one also bends, it is probably because it is striking a knot, hidden nail, or other metal. Withdraw it and start a new one in another place, or drill a hole past the obstruction and try again.

When driving casing and finishing naills, govern the driving blows so that the last blow leaves the head of the nail slightly above the surface of the wood. This avoids marring the surface with the hammer head. Then, set the nail with a nail set.

Setting a Nail

NOTE: Generally, nails are set in finished surfaces and covered with putty, plastic wood, or sawdust mixed with glue to avoid marring the appearance of the surface. Finishing nails (those with small heads) are most commonly used for this type of nailing. However, flathead nails can also be set, as when nailing clapboard siding.

1. Drive the nail in the usual manner until it is almost, but not quite, flush with the surface.
2. Choose a suitable size nail set, Figure 6. Use a size which does not enlarge the hole made by the head of the nail and yet is large enough to transmit the force of the blow effectively.

NOTE: Sets are made in several sizes. The most common sizes are 1/32 inch, 2/32 inch, and 4/32 inch. the size refers to the diameter of the small end of the tapered portion. The point of the set is hollowed to prevent it form slipping as the blow is struck.

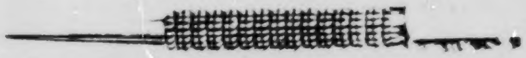

Figure 6 Nail Set

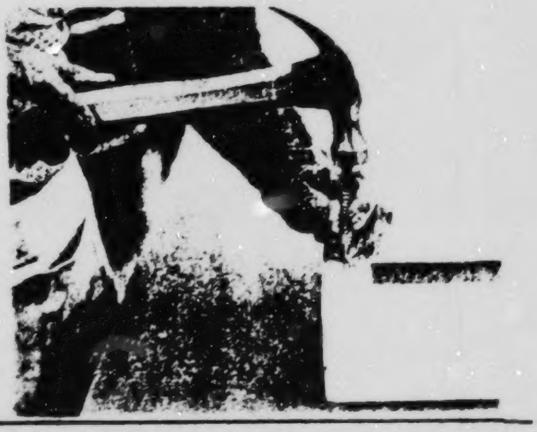

Figure 7 Using the nail set

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3. Refer to Figure 7. Hold the set between the thumb and forefinger and apply the point so that it is centered on the head of the nail. Rest the little finger on the work to steady the hand as the setting is being done.

4. With the nail set held in line, set the head with a light tap of the hammer about 1/16 inch below the surface. Try to set the nail below the surface with one hammer blow.

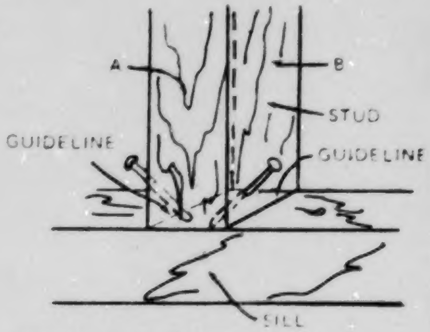

Figure 8 - Toenailing

Toenailing

NOTE: The purpose of toenailing to fasten a wood member to another which it butts against. See Figure 8.

Toenailing is done on the faces of members. Do not nail through the edges, A and B as splitting will probably result.

1. Position the vertical member in place.

2. Mark lines along each side of the stud of the face of the plate. This locates the stud.

3. Place the point of the nail so that one-third the length of the nail goes through the stud, Figure 8, and two-thirds of the length enter the sill.

4. Start the nail as in facenailing. After the nail has entered the wood at right angles, tip it to the angle in which it is to toe. This allows the nail to get a good start in the wood. If the nail is started on a slant, it might slip down the wood.

5. Drive the nails home on the first side. When driving the nail, put pressure on the opposite side with a foot or pull against the direction of nailing, to keep the board in its proper position. Even with this support, the board will move off the guidelines in the direction of nailing. Disregard this because the error can be corrected when nails are driven in from the opposite side.

6. Start the nails on the opposite side so that they do not line up with those just driven.

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7. Drive the nails home. Support the board from the opposite side as the board becomes correctly positioned. Continue striking the nails until the board is centered between the guidelines.

Nailing Bearing Members Together

1. Locate the nails or spikes so that they are staggered and at the top or bottom side of the beam. See Figure 9.

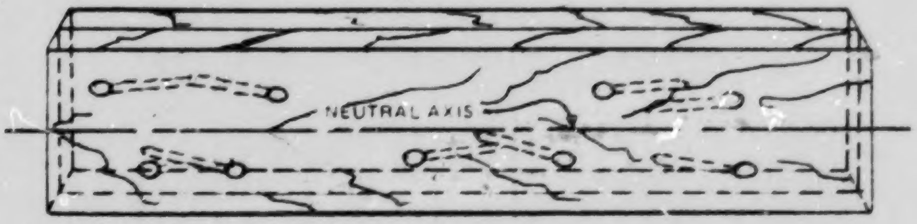

Figure 9 - Nailing two boards together.

NOTE: Avoid nailing along the center of the neutral axle.

2. Drive the nails so that they slant toward each other. Stagger them along the face of the board.

Clinching a Nail

NOTE: This method of nailing is used mainly in rough work when two thin pieces of material are being nailed together. For this, long nails are bent over or clinched to secure the required holding power.

1. Drive the nail as described for facenailing until the head is seated on the uppermost member.

2. Turn the two members over and strike the point from the side to bend it down.

3. Place the head on a flat metal surface. Strike the bent end with a firm, direct blow so that the bent portion becomes seated in the grain of the wood.

NOTE: Clinching with the grain gives a smooth surface. However, clinching across the grain makes a stronger and tighter joint. See Figure 10.

The direction of clinching is determined by the direction of force against the nail. If the force tends to move the top board to the left, then the points of the

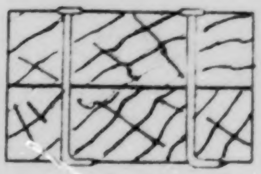

Figure 10 - Clinching

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nails should be bent in an opposite direction (to the right).

4. Another method of clinching is to place the two boards on a metal block. As the point is driven through the wood, contact with the metal turns the point to clinch the nail. The disadvantage of this method is that the direction of bending cannot be controlled.

Nailing into an End Grain

1. Determine where the nails are to be located.
2. Drive the nails at angles to one another as shown in Figure 11. By doing this, the nails also enter the end grain at an angle, resulting in a clinching effect and greater holdign power.

NOTE: Do not nail too close to the end as splitting may result. Drilling holes slightly less than the diameter of the nail through the top member helps to avoid this.

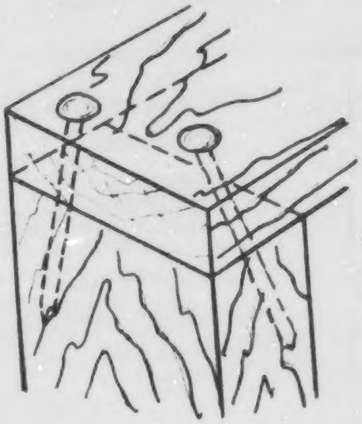

Figure 11 - Nailing into an End Grain.

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SELF-CHECK FOR ENABLING OBJECTIVE 1

number

PAGE 15 OF 43

DUTY

TASK

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PROG.

DIRECTIONS:

Evaluate your knowledge by answering True or False to the following items using a separate sheet of paper.

1. Nails hold in wood due to the wood fiber creating pressure against the sides of the nail.
2. Barbs, grooves, or coating on the nail improves its holding power.
3. Cut nails are more likely to split wood than common nails.
4. Nailing should be from a thin piece into a thick piece of wood.
5. A nail set should be selected which does not enlarge the hole made by the nail's head.
6. Nails are clinched when additional holding power is required.

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

PAGE 16 OF 43

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

1. True

2. True

5. False

4. True

5. True

6. True

All your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

DUTY	TASK	EN. OBJ.	DEPT.	PROG.

Enabling objective:

Identify screws and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to adquire knowledge about screws and their uses.	1 a. Text: Basic Carpentry, Chapter 43, pages 68-70. "Screws". b. Instruction Sheet enclosed, Screws
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 3.	
	6

Screws

Aside from nails, the wood screw is the most common fastening device used by carpenters. This type of fastening device has greater holding power than a nail and can be taken apart and put together with ease and without danger of damage. However, screws are not used as often as nails because of their cost and the time it takes to drive them.

WOOD SCREW SPECIFICATIONS

Wood screws are specified by the shape of their head, the type of slot on the head, the gauge (body diameter), length, material of the screw, type of finish, and special screws. Figure 1 shows the three shapes of heads most commonly found on wood screws - flat, round, and oval. Another type sometimes used is the fillister head shown in Figure 2.

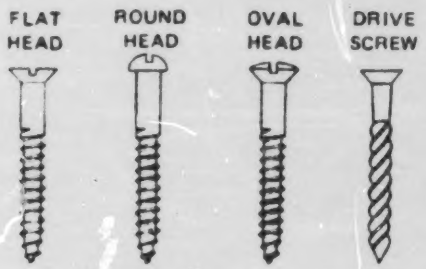
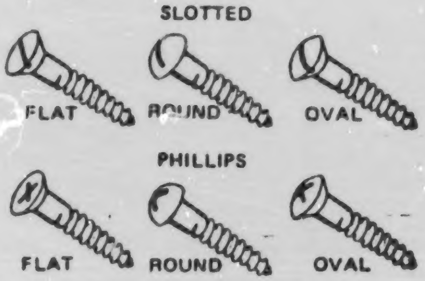
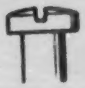


Figure 1



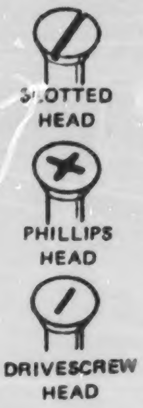
Screwheads are single slotted or have recessed cross slots (Phillips head). On the drive screw, the slot does not extend to the sides of the head (Figure 3) because it is partially driven in with a hammer, and then driven home with a screwdriver that fits the slot. If the slot went to the sides of the screw, the head might easily be broken off with the blows of a hammer.

Fig. 2

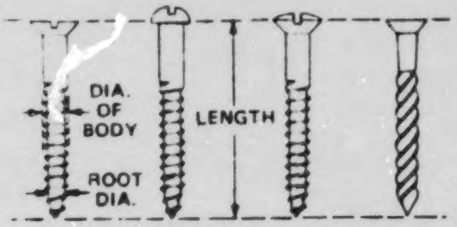


The size of a screw is designated by a gauge number and by its length. The gauge number is the outside diameter of the shank. The American Screwmakers' gauge is used to determine the gauge number.

Fig. 3



The length refers to the distance from the point of the screw to the point where the base of the head begins. See Figure 4.



4 Figure

SELECTING SCREWS FOR A JOB

A screw has a greater surface area than a nail. Because the threads are spread out beyond the root diameter of the screw, the screw grips wood better than a nail. Bright metal screws give the greatest holding power of any other of the screw family because the edges of the screw threads are sharp. The coating on screws decreases their holding power because the screw is coated after the threads are cut, and the coating tends to round the sharp edges of the threads. Sometimes they are overcoated. These should not be used if the slots and threads are filled. To get the greatest holding power, 2/3 of the length of the screw should enter the lower board.

Screws are chosen according to the job. For ordinary work where speed is needed and the screws are not exposed to moisture, the bright screw can be used. For high-grade work and where the screws can come in contact with moisture, brass, bronze, coated, or plated screws should be used.

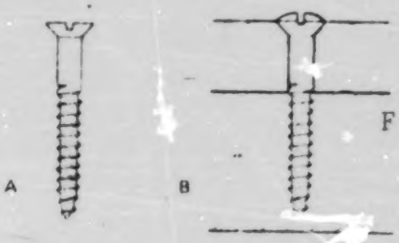


Fig.5

Flathead screws are used where the head of the screw must be flush with or below the surface of the wood. The shoulders of the hole must be countersunk or counterbored to fit the outside diameter of the head.

Roundhead screws are used when the surface does not have to appear flat. Sometimes they are used in an ornametal pattern. At other times the roundhead is preferred to the flathead because the flathead acts as a wedge and can split the work. Both flathead and roundhead wood screws can be hidden by counterboring and then plugging the hole.

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Ovalhead screws have uses where the slightly raised portion of the head lends itself to produce an ornamental effect. It is also sometimes preferred over the flathead type because of the greater strength of its head. This is apparent from a study of Figure 5. This type of screws used for fastening exposed door hinges. Countersinking is required for seating the head, and is done to a depth so that only the curved portion of the head is above the surface. See B, Figure 5.

Phillips head screws are best suited for production work. The special slots, together with a special type of screwdriver, permit these screws to be driven quickly and with less chance for the screwdriver slipping from the slot.

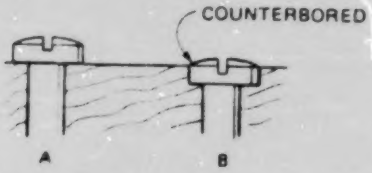

Fig. 6

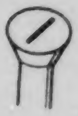

Fig. 7

Screws with fillister heads are used for the same reasons as ovalhead screws. However, in some instances, they are preferred to the ovalhead type because the flat underside of the head does not produce a wedging action which can cause splitting. This type of screw can be used with the entire head above the surface (A, Figure 6) or it can be seated by counterboring so that only the oval part of the head protrudes, as in B.

The drive screw is used where speed and economy are important factors. It is especially good where holding power is needed and when appearance is not stressed.

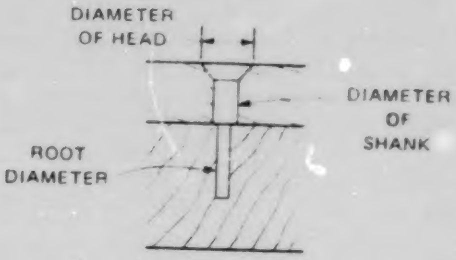

Fig. 8

This type of screw is most suitable for use in softwood. When used in softwood, countersinking is not necessary. The head seats itself by compressing the wood fibers.

PREPARATION FOR DRIVING WOOD SCREWS

When driving flathead and ovalhead wood screws to fasten two boards, first drill a clearance hole (diameter of shank) through the top board. See Figure 7. Then drill a pilot into the bottom piece the size of the core or root diameter of the screw threads. For hardwoods the pilot hole should be drilled to slightly more than the full depth to which the screw will be driven. For softwoods, the pilot hole can be drilled to one-half this depth. Finally, the top piece is countersunk to receive the head of the screw.

The preparation of screwholes, other than for flathead and ovalhead screws, is done in a similar manner except that countersinking is not done. In some cases counterboring is a part of the preparation for driving a screw. Counterboring can be done for recessing all types of screw heads.

When a screw hole is to be prepared with a counterbore, the counterbore must be bored first if a bit is used. This is not necessary when a drill is used. However, a counterbored hole drilled after the body and pilot hole have been drilled usually does not have as clear cut an edge at the surface as it would if it were drilled first.

TOOLS FOR DRIVING SCREWS

The tools used for driving screws include the conventional type of screwdriver, square shank screwdriver, ratchet screwdriver, spiral-ratchet screwdriver, Phillips screwdriver, and brace and screwdriver bit.

Driving Screw Eyes and Screw Hooks

1. Prepare a pilot hole equal in size to the root diameter of the thread (similar to that for the conventional type of wood screw).

   NOTE: No clearance hole is prepared. These types of screws are driven only to the extent of the threaded portion and the remainder protrudes.

2. Start the screw in the pilot hole by grasping the head portion with the thumb and forefinger and turning it clockwise until the point is seated.

3. Fit an open-end adjustable wrench across the head and drive the screw as though turning a nut.

4. An alternate method for driving the screw eye and screw hook is to insert the round shank of a screwdriver within the head and then revolve it. For the square, bent hook, a short length of small pipe can be fitted over the bent portion and used as a handle to drive it.

LAG SCREWS AND HANGER BOLTS

Lag screws, Figure 9, are like large, ordinary wood screws except that the head is square and unslotted. A wrench instead of a screwdriver must be used to drive or withdraw this type of screw.

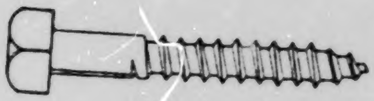

Fig. 9

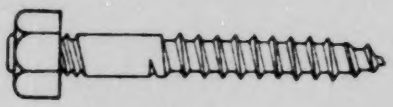

Fig. 10

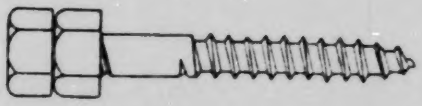

Fig. 11

Lag screws are sized by diameter and length. Common diameter sizes are 1/4 inch, 5/16 inch, 3/8 inch, 1/2 inch, and 5/8 inch. Lengths range from 1 inch to 6 inches in 1/2-inch steps, and from 6 inches to 12 inches in 1-inch steps. They are made in black iron, galvanized iron, and bronze.

This screw is used where great holding power is needed in rough work. Its uses include fastening heavy parts (wood or metal) to wooden surfaces and masonry surfaces into which expansion shields have been placed. As with the ordinary wood screw, pilot and clearance holes are prepared if two parts are to be held together. A metal washer should be placed under the head so that it does not cut into the wood surface as it is driven home.

Hanger bolts, Figure 10, have both ends threaded. The head end has a standard machine screw thread to which a square or hexagon nut is applied. Like the lag screw, the hanger bolt is sized by diameter and length.

Hanger bolts are used the same way as lag screws. They work better than lag screws where parts must be unfastened for repairs or replacement. Since only the nut which forms the head is unscrewed, the wood screw portion is never removed.

In driving this type of screw, two nuts are first locked together short of the shoulder of the thread. See Figure 11. A wrench is then applied to the top nut for driving. On completion of the driving, the extra nut is removed. This technique prevents jamming of the nut on the shoulder of the thread, which would cause the entire bolt to come loose.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 24 OF 43

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DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.

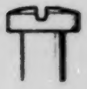

Fig. 1

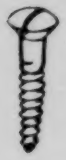

Fig.2

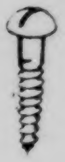

Fig. 3

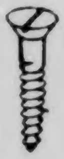

Fig.4

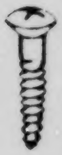

Fig.5

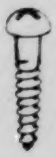

Fig. 6

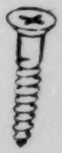

Fig.7

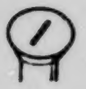

Fig. 8

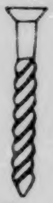

Fig. 9

a. Phillips oval

b. Straight round

c. Phillips round

d. Phillips flat

e. Drive-screw

f. Straight oval

g. Fillister head

h. Straight flat

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number
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1. g
2. f
3. b
4. h
5. a
6. c
7. d
8. e

All of your answer should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3

number

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Enabling objective:

Identify masonry fasteners and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to learn about masonry fasteners and their uses.	1 a. Text: Basic Carpentry, Chapter 4, "Masonry Fasteners", page 71. b. Instruction Sheet enclosed, Miscellaneous Masonry Fasteners.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 4.	

Miscellaneous Masonry Fasteners

THE LAG SCREW EXPANSION SHIELD

A lag screw shield is a malleable iron split casting with internal threads. The shield is an anchoring device for lag screws which are to be driven in masonry walls.

Expansion shields are also made for use with machine bolts. The threads within this type of shield are different. Be sure the proper shield is selected for the job.

Lag screw expansion shields are made in sizes for use with 1/4-inch, 5/16-inch, 3/8-inch, 7/16-inch, 1/2-inch, 5/8-inch, and 3/4-inch lag screws. Two lengths are available, short and long. The outside diameter of the shield is a standard fractional size so that the selection of drills for preparing a hole for the shield is not a problem. For example, a shield for 1/4-inch lag screw has an outside diameter of 1/2 inch and is made in 1 inch and 1 1/2 inch lengths.

To use this device, a hole equal to the outside diameter of the shield is first drilled into the masonry. The depth of the hole should be equal to, or slightly greater than the length of the shield. The shield is then inserted in the hole as in Figure 1. The proper size lag screw driven into the threads causes the shield to expand (more at end B, Figure 1 than at end A) and puts pressure on the sides of the hole, thus providing a secure anchor in the masonry.

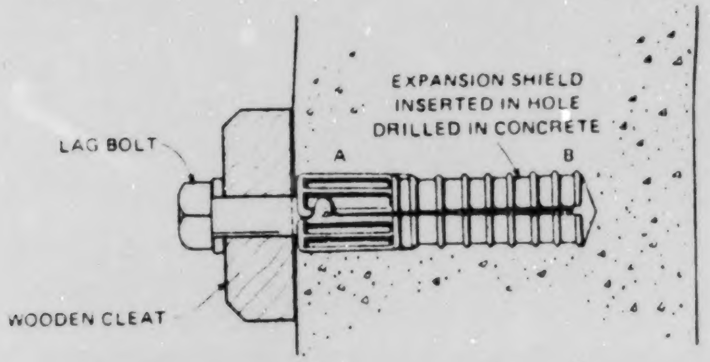


Fig.1 Lag screw expansion shield fitted in masonry wall.

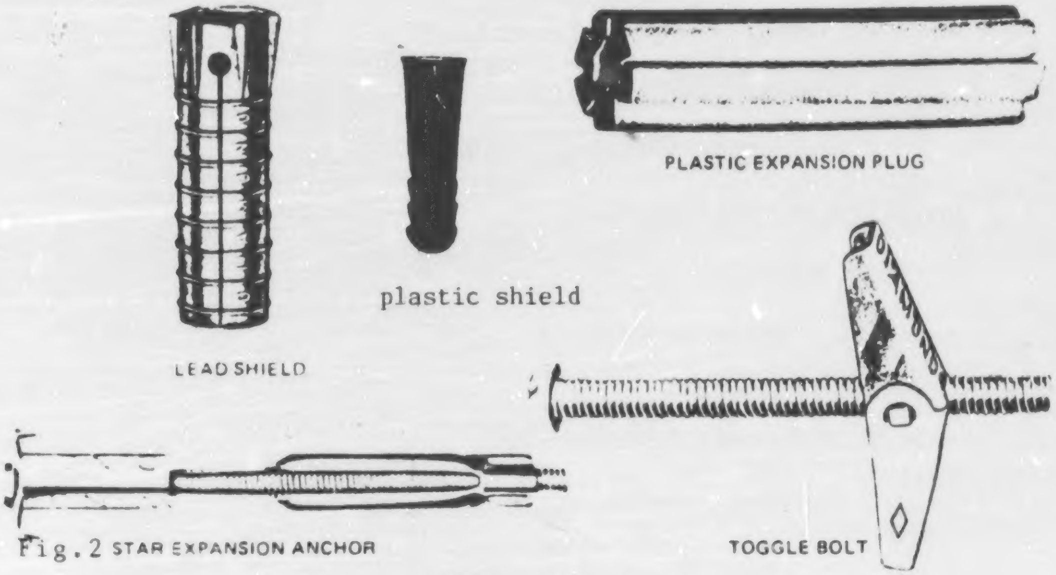

LEAD SHIELD
plastic shield
PLASTIC EXPANSION PLUG
STAR EXPANSION ANCHOR
TOGGLE BOLT

Fig.2

Other anchoring devices.

OTHER ANCHORING DEVICES

Fig.2

Several other devices used for anchoring screws in masonry walls are lead shields, plastic and fiber expansion (rawl) plugs, star expansion anchors, and toggle bolts. See Figure 2.

Lead shields and expansion plugs have an unthreaded hole. The threads of the screw cut into the soft material of the plug causing it to expand to anchor the screw. See Figure 3 . The outside diameter of these anchors range from 5/32 inch to 3/4 inch. Each diameter size can be obtained in various lengths.

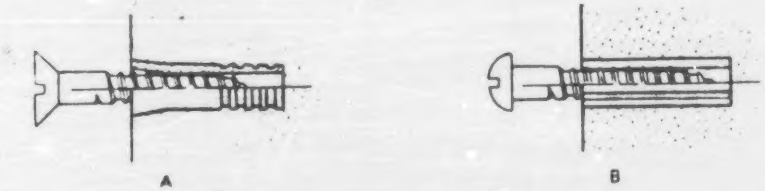
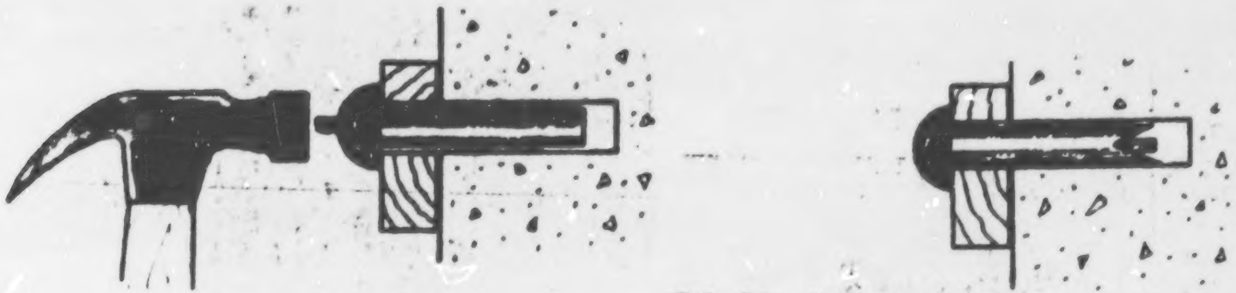


Fig.3 (A) Application of a lead shield (B) Application of a plastic expansion plug

Star expansion anchors, Figure 2, are used to fasten fixtures to plastered walls and composition wallboard. To apply this device (See Figure 4), a hole is drilled in the wall for the unit. Prongs on the shield are forced into the surface of the wall to prevent the shield from turning while the anchor screw is driven. About ten turns of the screwdriver completes spreading of the shield within the hole. This anchors the shield to the wall. The screw is then removed from the shield, inserted through the fixture to be attached, and then redriven.

Pin-grip anchors are used to attach objects to solid masonry. Available in 3/16 inch and 1/4-inch diameter, they range in length from 3/4 inch to 1 1/2 inches. They are installed in the following manner:

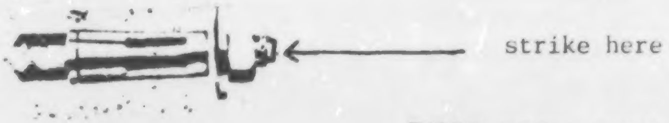


1. DRILL A HOLE IN THE MASONRY. INSERT THE PIN-GRIP ANCHOR THROUGH THE MATERIAL TO BE FASTENED TO THE WALL. STRIKE THE PIN WITH A HAMMER.

2. THE PIN EXPANDS THE END OF THE ANCHOR, WEDGING IT INTO THE SIDES OF THE HOLE.

Fig.4

Lead -caulking anchor install machine screws and bolts in masonry. First, a hole is drilled, then the anchor is placed in the hole and the bolt is driven into place. This flares the bottom of the anchor out, and binds it to the sides of the hole. These anchors are used in solid masonry. Sizes range from No. 6 to 3/4 inch in diameter.



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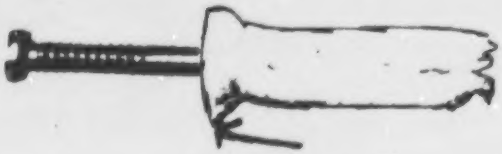
Philips Nylon Anchor Screws are used in both solid and

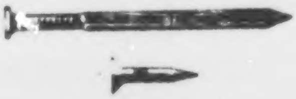


hollow materials. The shoulder of the anchor prevents it from going into a hollow wall. To install these anchors, drill a hole, insert the anchor, and drive the screw with a hammer.

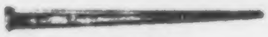
Anchor plates are installed with a plastic or epoxy cement. Put the plastic on the wall, and push the plate against it until the plastic comes through the holes. After curing time has elapsed, the bolt in the center of the plate is ready for use.

Masonry Nails - Case Hardened Cut Nails-

These nails are used for attaching wood to masonry or concrete walls, floors, etc. They should be driven with a large ball hammer, or engineers hammer, and never with a claw hammer. Safety glasses should always be worn when driving these nails.



MASONRY NAILS



CUT NAIL

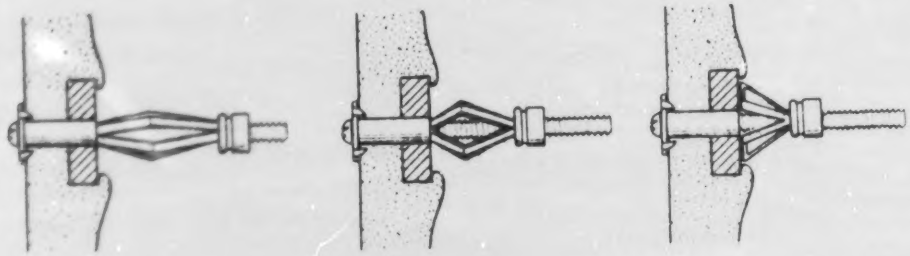
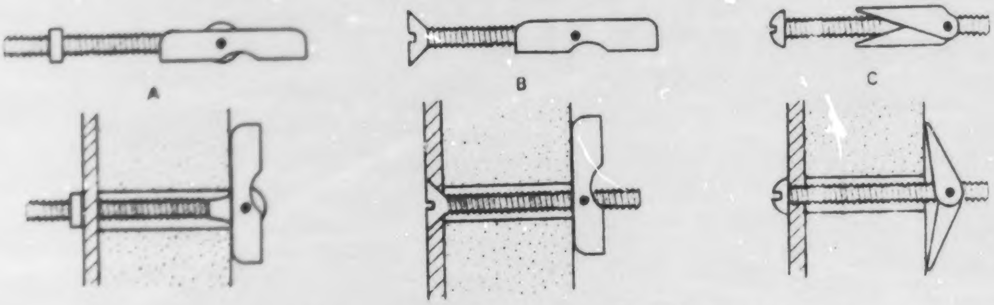


Figure 5 Locking a star expansion anchor into place.



Types of toggle bolts and their method of application.

Toggle bolts, Figure 5, are used to fasten woodwork to hollow tile walls. The section which expands folds down so that it can be inserted in a hole drilled through the tile surface. After the bolt is inserted the expanding portion pivots or spreads out so it cannot be withdrawn. The screw (A and B, Figure 5) or nut (C, Figure 5) can then be tightened to fasten the object to the wall.

DRILLING HOLES IN MASONRY WALLS FOR ANCHORING DEVICES

1. For drilling in plaster and other soft masonry materials, select a conventional type of straight-shank drill. In general, the size selected should be equal in diameter to the outside diameter of the anchoring device. The size of the drilled hole should be such that it gives a snug fit of the anchoring device.

2. For drilling in hard masonry materials, select a carbide-tipped drill, Figure 6 and proceed to drill as with an ordinary drill. Water used as a cutting lubricant speeds the cutting.

CAUTION: WATER AS A LUBRICANT SHOULD NOT BE USED IF DRILLING IS DONE WITH A PORTABLE ELECTRIC DRILL.

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3. Drilling masonry can also be done with a star drill, Figure 7. This tool is like the cold chisel except that the point is star shaped. These drills are generally made in 8-inch and 12-inch lengths. The point sizes for the 8-inch lengths range from 1/4 inch through 3/4 inch and for the 12-inch lengths from 1/4 inch through 1 1/4 inches. Like a conventional chisel, it is driven with a hammer. When using the star drill, tap it lightly and keep revolving it, or else it binds or breaks out the inside of the masonry (if a hollow type).

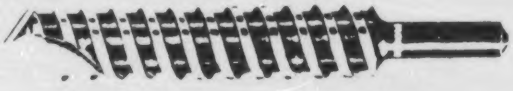

Figure 6 Carbide-tipped drill

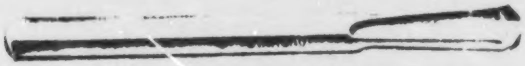

Figure 7 Star drill

CAUTION: GOGGLES SHOULD BE WORN FOR EYE PROTECTION WHEN DOING THIS TYPE OF DRILLING.

SELF-CHECK FOR ENABLING OBJECTIVE 3 number PAGE 33 OF 43

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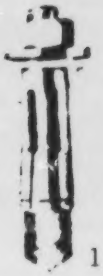
DIRECTIONS:

Evaluate your knowledge matching the items below using a separate sheet of paper.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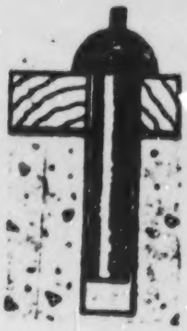
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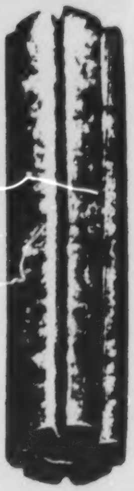
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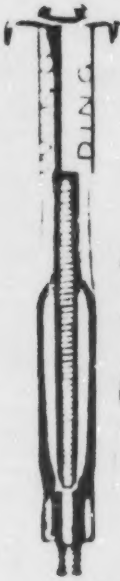
a. star expansion anchor
b. lead shield
c. plastic expansion plug
d. toggle bolt
e. lead caulking anchor
f. pin-grip anchor



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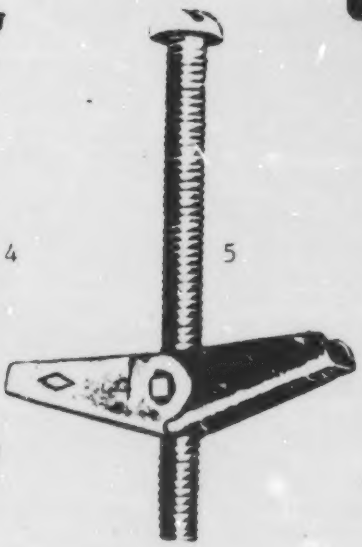
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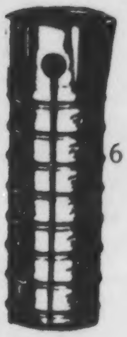
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Now check your answer with the Answer Key.

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1. e
2. f
3. c
6. a
5. d
6. b

All your answer should agree with the answer on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 4 number

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Enabling objective:

Identify bolts and nuts used in carpentry.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to acquire knowledge of bolts and nuts.	1. a. Text: Basic Carpentry, Chapter 4, "Bolts," page 70 - b. Instruction Sheet enclosed, Bolts and Nuts Used in Carpentry
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test.
4. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 5	

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Bolts and Nuts Used in Carpentry

Various types of bolts are used to fasten wooden members together. Those most often used by the carpenter are shown in Figure 1.

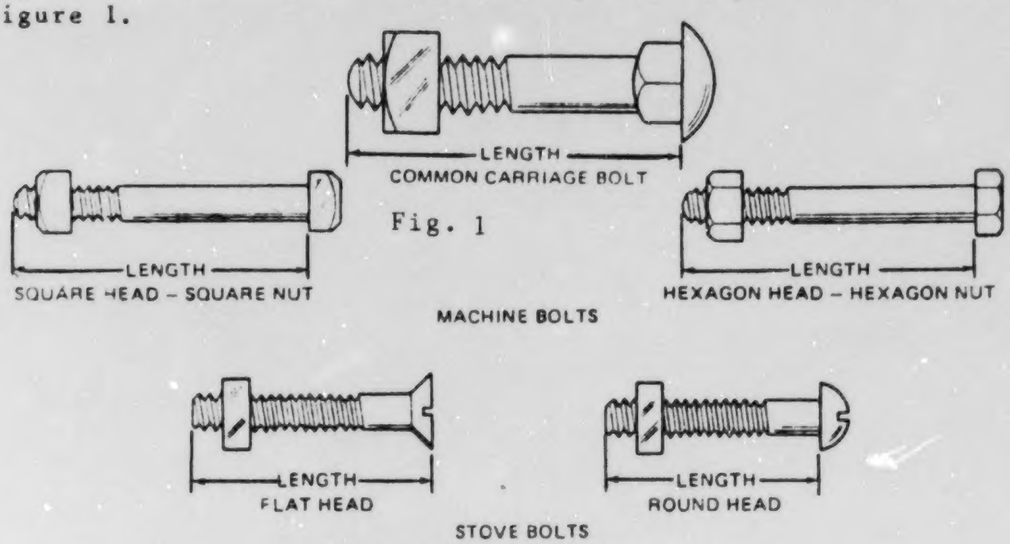

LENGTH
COMMON CARRIAGE BOLT
LENGTH
SQUARE HEAD – SQUARE NUT
LENGTH
HEXAGON HEAD – HEXAGON NUT
MACHINE BOLTS
LENGTH
FLAT HEAD
LENGTH
ROUND HEAD
STOVE BOLTS

Fig. 1

Fig.2 Machine bolts and stove bolts

Bolts differ from wood in that they are not threaded into the wood. Holes must be drilled through the wood or metal members so that the bolt passes through. A nut is then threaded to the end to hold the members together.

Bolts sizes are specified by the diameter of the thread or body and by length. The length is measured from the bottom of the head to the end except for the flathead stove bolt which is measured from the top of the head to the end.

Compared to other bolts, stove bolts are rather small, ranging in lengths from 3/8 inch to 4 inches and in body diameter from 1/8 inch to 3/8 inch. Carriage and machine bolts range from 3/4 inch to 20 inches long and from 3/16 inch to 3/4 inch in diameter.

Refer to Figure 2. The carriage bolt has a square section below the head which is embedded in the wood as the nut is drawn up, thus preventing the bolt from turning as the nut is tightened. It is used only in wood.

The machine bolt has a square or hexagon head which is held with a wrench to prevent the bolt from turning as the nut is tightened.

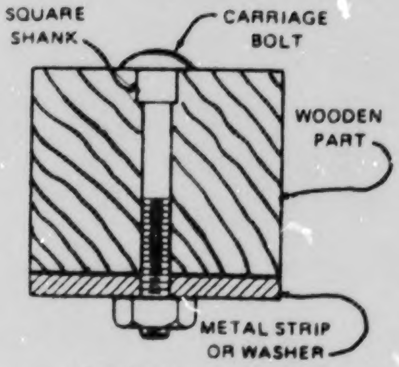

SQUARE SHANK
CARRIAGE BOLT
WOODEN PART
METAL STRIP OR WASHER

Fig. 3 **Installation of a carriage bolt.**

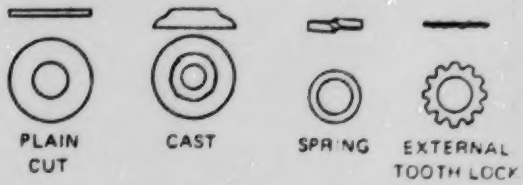

PLAIN CUT
CAST
SPRING
EXTERNAL TOOTH LOCK

Figure 4 Types of washers.

Washers should be used with bolts to prevent the nut from cutting into the wood as it is tightened. Washers also distribute the pressure over a wider area. The spring lock and external tooth (star) washers are used to prevent the nut from working loose. See Figure 3.

Several types of nuts used on bolts are shown in Figure 4. The cap nut is used where appearance is important. It conceals the bolt end, and also reduces the possibility of an accident by catching on the end of a protruding bolt.

The wing nut is used where finger pressure is enough to secure the members in place. Wing nuts also work well where frequent changes or adjustments are necessary.

Whenever possible, apply oil to the threads of a nut before fitting it to a bolt. This helps to prevent corrosion (which makes it difficut to remove the nut).

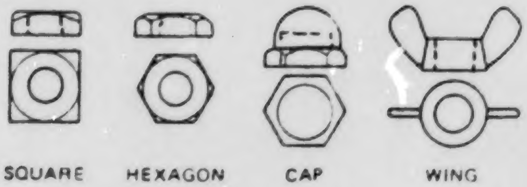

SQUARE
HEXAGON
CAP
WING

Fig. 5 Types of nuts.

BEST COPY AVAILABLE

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. Stove bolts have a round head or a flat head which is held by a screwdriver for tightening.
2. Carriage bolts have shoulders which pull into the wood, as the nut is tightened, and prevent the bolt from turning.
3. Machine belts may have either square or hexagon shaped heads.
4. Washers allow the nut to be drawn into the wall as it is tightened.
5. Oil should be applied to the threads of a nut before installation, if possible, to prevent corrosion.

Now check your answers with the Answer Key.

1. True
2. True
3. True
4. True
5. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 5 number PAGE 40 OF 43

DUTY | TASK | EN. OBJ. | DEPT. | PROG.

Enabling objective:

Practice using fasteners.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for your job assignment.	1. Instructor
2. Prepare a job plan sheet which lists tools, materials, and steps for completing this assignment.	2. Job Plan Sheet.
3. Have instructor check your job plan sheet.	3. Instructor
4. Practice using fasteners.	4. a. Prepared Job Plan Sheet. b. Tools c. Materials
5. Complete the Self-Check.	5. Self-Check enclosed.
6. Have instructor inspect your work.	6. Instructor
7. When you think you can perform this task, take the Performance Test.	7. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 5 number PAGE 41 OF 43

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

DIRECTIONS:

Evaluate your work by completing the items below using a separate sheet of paper.

All items should receive a "YES" response.

	YES	NO
1. Was the proper nail selected for each job?....	____	____
2. Were the nails driven properly?...............	____	____
3. Were the nails spaced properly...............	____	____
4. Were the cut nails driven with the straight side parallel to the grain?..................	____	____
5. Was the proper screw selected for each job?...	____	____
6. Were the screws installed properly?...........	____	____
7. Was the proper masonry anchor selected for each job?...................................	____	____
8. Were the masonry anchors installed properly?.	____	____
9. Was the belt installed with the proper sequence of bolt, nut, and washer installation?	____	____
10. Was oil applied to the threads and proper tension applied when the nut was tightened?..	____	____

If you received a "NO" response for any item go back and repeat one or more of the Learning Activities for this Enabling Objective.

PERFORMANCE TEST FOR

C	1	1
duty	task	number

PAGE 42 OF 43

DIRECTIONS:

Given access to fasteners and tools, you will use fasteners. You will be evaluated for attainment of this task, based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Was the proper nail selected for each job?...............		
2. Were the nails driven properly?..........................		
3. Were the nails spaced properly?..........................		
4. Were the cut nails driven with the straight side parallel to the grain?....................................		
5. Was the proper screw selected for each job?..............		
6. Were the screws installed properly?......................		
7. Was the proper masonry anchor selected for each job?..		
8. Were the masonry anchors installed properly?.............		
9. Was the bolt installed with the proper sequence of belt, nut, and washer installation?..........		
10. Was oil applied to the threads and proper tension applied when the nut was tightened?......................		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

Instructional Resources

Text

Capostosto, J., Basic Carpentry, Reston Publishing Company, Reston, Virginia, 1980.

KNOWLEDGE TEST FOR C 1 1

duty task number

PAGE 1 OF 2

DUTY

TASK

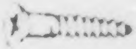
DEPT.

PROG.

TASK: Use Fasteners

DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.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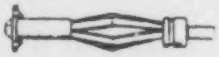
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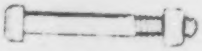
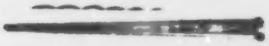
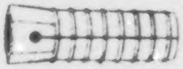
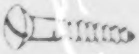

C


B


E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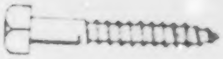
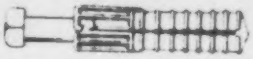
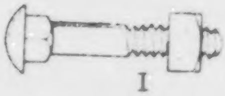

C


F


I

1. lead shield
2. lag bolt
3. lag bolt and lead shield
4. Phillips flat head screw
5. slotted oval head screw
6. machine bolt
7. carriage bolt
8. star expansion anchor
9. case hardened cut nail

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

10. Cut nails are more likely to split wood than common nails.
11. Nails are clinched for additional holding power.
12. Barbs, groovers or coating on a nail improve its holding power.

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KNOWLEDGE TEST FOR C 1 1

CONTINUED duty task number

PAGE 2 OF 2

DUTY	TASK	DEPT.	PROG.

13. Oil should be applied to the thread of a nut before tightening to prevent corrosion.

14. Washers prevent the nut from being drawn into the wood as it is tightened.

15. Machine bolts may have either square or hexagon shaped heads.

29

COMPLETING CORE CURRICULUM
Use fasteners

1. e
2. c
3. f
4. a
5. h
6. g
7. i
8. d
9. b

10. False
11. True
12. True
13. True
14. True
15. True

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

DUTY

TASK

PREREQ.

DEPT.

PROG.

REVISED

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 3 2 Follow-up Application and Interview

PURPOSE:

Even after an application has been submitted and an interview given, there are methods of increasing your chances of being hired. These methods are called follow-up methods. If these methods are applied in a courteous manner they may place you in line for consideration for future openings even if not for the job you applied for. This learning guide will assist you in learning these methods.

PLEASE DO NOT WRITE IN LEARNING GUIDE

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DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance,
and standard)

GIVEN: access to an interviewing situation,

YOU WILL: follow-up an application and interview.

HOW WELL: Your performance will be assessed by your instructor using the Perforamnce Test on page 12.

ENABLING OBJECTIVES:

1. Identify follow-up methods.
2. Practice following-up a job interview.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number PAGE 4 OF 13

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Enabling objective:

Identify follow-up methods.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify follow-up methods.	1. Instruction Sheet enclosed, What To Do After the Interview
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

What To Do After the Interview

1. Inform the person who referred you to the job regarding the outcome of your interview.

2. If the job is offered to you, notify the employer of your acceptance as soon as possible. Assure him or her that you will report at the time and place designated.

3. If you accept some other job in the meantime, you should immediately notify both the employer to whom you applied and the person who referred you to the job.

4. If you did not get the job, think through your first interview and try to discover what you could have done better.

5. Don't be discouraged if you do not get the first job for which you apply. Fortitude is needed in job seeking. Stick to it until you get the kind of job you want.

6. Be courteous, even if you did not get the job. You might be considered for another one at a later date. If you have impressed the interviewer with your courteous manner, your chances of future employment are much better.

Your Follow-Up Letter

Before you leave the interview, you should thank the interviewer for spending time with you. If you are offered a job during the interview, be sure to thank the interviewer and let him/her know that you will do your best on the new job. If you aren't sure whether to accept the job, ask the interviewer if you can call back with your answer in a day or two. Be sure to say exactly when you will call back.

Sometimes you will receive a letter offering you the job several days after the interview. If this happens, contact the employer right away. If you want the job, say so. If you don't want the job, immediately tell the employer that you are not interested.

If at any time you accept another job, let the interviewer know. The employer who interviewed you will be pleased that you let him/her know that you are no longer interested in the job. That way the interviewer can quit counting on you as being interested in a particular job.

If you sense immediately after an interview that you will not be offered the job, think about what went wrong and use this information to help you do better in your next interview. Keep in mind that not all job interviews are successful.

In any case, it is a good idea to write a follow-up letter. This is a letter which:

- thanks the interviewer for talking with you about the job.
- tells the interviewer that you are interested in the job.
- tells the interviewer that you think you are qualified for the job.

The employer will appreciate your thoughtfulness, and you may even get the job because of your follow-up letter.

Look at the sample letters below. Follow-up letters should be typed, like this one, or written neatly in ink.

Sample Follow-up Letter

DON'T FORGET THE HEADING

619 Appleyard Way
Pensacola, Florida 32503
May 10, 1976

INCLUDE THE NAME AND ADDRESS OF THE INTERVIEWER.

USE A COLON AFTER THE SALUTATION

Mr. Andrew Smith
Engle's Roofing Company
1800 Palafox Street
Pensacola, Florida 32502

THE Salutation SERVES AS A GREETING TO THE PERSON YOU ARE WRITING.

Dear Mr. Smith:

Thank you for taking time to talk with me on Friday. The clerk-typist position that we discussed interested me greatly. I believe I have the qualifications to do the job well and hope that you will consider me for the position.

I look forward to hearing from you. Thank you again for your time and consideration.

THIS IS THE BODY OF YOUR LETTER.

Sincerely,

THIS IS YOUR CLOSING

Penny Page

Penny Page

YOUR SIGNATURE.

Notification to Prospective Employer

315 S.E. Park Street
Belle Glade, Florida 33430
April 26, 1983

Mr. John S. Shott
Down-the-Creek Construction Company
100A Dead End Road
Dead City, Florida 33668

Dear Mr. Shott:

1 Thank you for considering me as an employee with your firm. 2 Since our interview, I have accepted employment with another company which 3 offered a higher starting wage than we discussed. 4 I was excited about the possibility of working with you, but feel that I must take the job with the highest pay.

5 Thank you again for your consideration.

Sincerely,

Willy Flopp

Willy Flopp

The items listed below refer to the letter above. They show the significant points brought out in the letter. You will note that the same form is used in this letter as was used in the follow-up letter.

1. Appreciation for consideration.
2. Purpose of letter -- notifying the firm of having accepted another job.
3. Reason for accepting the other job -- this should only be included if it can be expressed in a courteous, positive manner.
4. Complimentary refusal -- a compliment to the firm yet showing a final decision.
5. Additional gratitude and courtesy.

REMEMBER: Be honest and sincere. If you cannot express a point with honesty, then omit the sentence.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number

PAGE 8 OF 13

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by completing the items below on a separate sheet of paper.

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

There are three important points to a follow-up letter. They are:

1. Thanking the interviewer for talking with you about the job.
2. Telling the interviewer whether or not you are interested in the job.
3. State confidence in your qualifications for the job.

4. You should notify the employer of your acceptance of a job as soon as possible.
5. You should show courtesy whether or not you get the job.

Evaluate your knowledge of writing a follow-up letter by reading the letter below and inserting the missing sentence. Write the sentence you would add on a separate sheet of paper.

222 Second Street
Bigtown, Florida 33300
November 2, 1976

Ms. Melanie Fleming
Quick Transportation Company
999 Central Circle
Bigtown, Florida 33300

Dear Ms. Fleming:

Thank you for the interview we had last Friday. I am very interested in the radio dispatcher job that we discussed.

Sincerely,

Sarah Sure

Sarah Sure

Now check your answers with the Answer Key.

BEST COPY AVAILABLE

LF-CHECK FOR ENABLING OBJECTIVE 1 number
SWER KEY

PAGE 9 OF 13

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. True
2. True
3. True
4. True
5. True

Letter

Sarah should have told Ms. Fleming that she was qualified for the job. Your sentence should be something like these examples:

"I am sure I could do a good job for your company and would appreciate being considered for the position."

"I believe I am qualified for the job and hope you will consider me for this position."

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2

number

PAGE 10 OF 13

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice following-up a job interview.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Practice following up a job interview by completing your job assignment.	2. Job Assignment
3. Complete the Self-Check.	3. Self-Check enclosed.
4. When you think you can perform this task, take the Performance Test.	4. Performance Test

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SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 11 OF 13

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

DIRECTIONS:

Evaluate your work by answering the items below.

ALL items should receive a "YES" response.

	YES	NO
Follow-up Letter		
1. Was the letter written using courteous expressions?....................	___	___
2. Was an expression of thanks made for the consideration of the interviewer?....	___	___
3. Was an interest in the job expressed?..................................	___	___
4. Was confidence in potential employee's qualifications expressed?.......	___	___
Letter of Notification		
1. Was the notification of employment with another firm written in a courteous manner?..	___	___
2. Was the simulated phone conversation with the person who referred you for the interview conducted in a courteous manner?................	___	___

If you received a "NO" response for any item, go back and repeat one or more of the Learning Activities for this Enabling Objective.

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PERFORMANCE TEST FOR C | 3 | 2

duty task number

PAGE 12 OF 13

DIRECTIONS:

Given access to an interviewing situation, you will follow-up an application and interview. You will evaluated for attainment of this task, based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
Follow-up Letter		
1. Was the letter written using courteous expressions?		
2. Was an expression of thanks made for the consideration of the interviewer?		
3. Was an interest in the job expressed?		
4. Was confidence in potential employee's qualifications expressed?		
Letter of Notification		
1. Was the notification of employment with another firm written in a courteous manner?		
2. Was the simulated phone conversation with the person who referred you for the interview conducted in a courteous manner?		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained

☐ Not attained

EVALUATOR

DEPT.

PROG.

LIST OF RESOURCES, MATERIALS, AND EQUIPMENT

PAGE 13 OF 13

DUTY

TASK

DEPT.

PROG.

No additional resources required.

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C Completing Core Curriculum

TASK: 2 0 Use Band Saw and Scroll Saws

PURPOSE:

The band saw and scroll saw are seldom used in general carpentry. They are primarily stationary shop tools, but may be moved to field sites if a great amount of curved cutting is to be done. This Learning Guide will assist you in acquiring both the knowledge and skills necessary for safe operation of these saws.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

OBJECTIVES

PAGE 3 OF 16

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to a band saw and resource material,

YOU WILL: use band saw and scroll saw.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be evaluated by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify safe operation practices and component parts.
2. Identify common operation of a band or scroll saw.
3. Practice using the band saw.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number

PAGE 4 OF 16

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Enabling objective

Identify safe operation practices and component parts.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify safe operation practices.	1. Instruction Sheet enclosed, Band and Scroll Saw Safety Practices.
2. Use Resource No. 2 to identify component parts.	2. Instruction Sheet enclosed, Band Saw Component Parts.
3. Evaluate your knowledge using the Self-Check	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

3

Band and Scroll Saws Safety Practices

1. Keep your hands and fingers out of the 4" (102 mm) safety margin around the blade.

2. Check the saw blade to make sure it has proper tension and that the teeth point downward.

3. Be sure the saw is grounded properly.

4. With power off and cable disconnected, make sure that the wheel guards are securely in place.

5. Make all adjustments before connecting to power supply.

6. Lower blade guide so that it is not more than 1/4" above the work, this will keep the blade from twisting.

7. Make sure that all guards are securely fastened and that the throat plate is clear of sawdust.

8. Feed the work evenly and slowly so that you don't twist or crowd the blade.

9. Never back the saw out of long cuts because this may pull the blade off the wheels.

10. Keep fingers at least 2 inches from blade when cutting.

11. Keep your full attention on the work. Do not allow disturbance to distract your attention when band saw is in operation.

12. Before backing out of a cut, turn off the power and allow the blade to come to a complete stop.

13. Make sure the stock has at least one flat surface before you place it against the table.

14. If the blade should break while cutting a board, turn the band saw off immediately and tell instructor about the break.

15. Disconnect the power before changing or working around any cutting tools.

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 1 number PAGE 6 OF 16

DUTY

TASK

EN. OBJ.

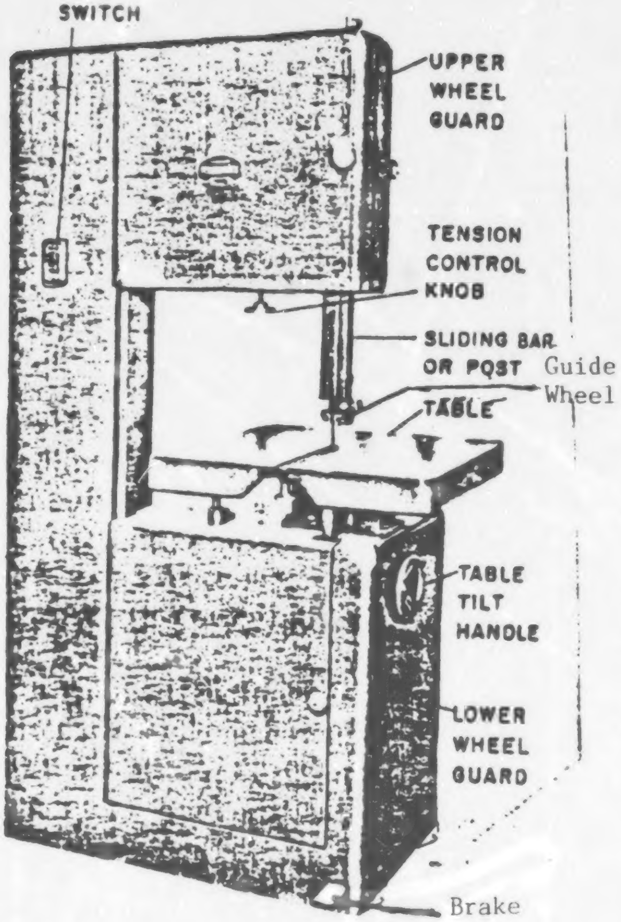
DEPT.

PROG.

Band Saw Component Parts

The part of a Band Saw are shown below.

This drawing shows the same type of band saw we have in the shop. Study this drawing and be able to identify the parts of the saw on both shop saw and the drawing.


SWITCH
UPPER WHEEL GUARD
TENSION CONTROL KNOB
SLIDING BAR OR POST
Guide Wheel
TABLE
TABLE TILT HANDLE
LOWER WHEEL GUARD
Brake

SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 7 OF 10

DUTY

TASK

EN. OBJ.

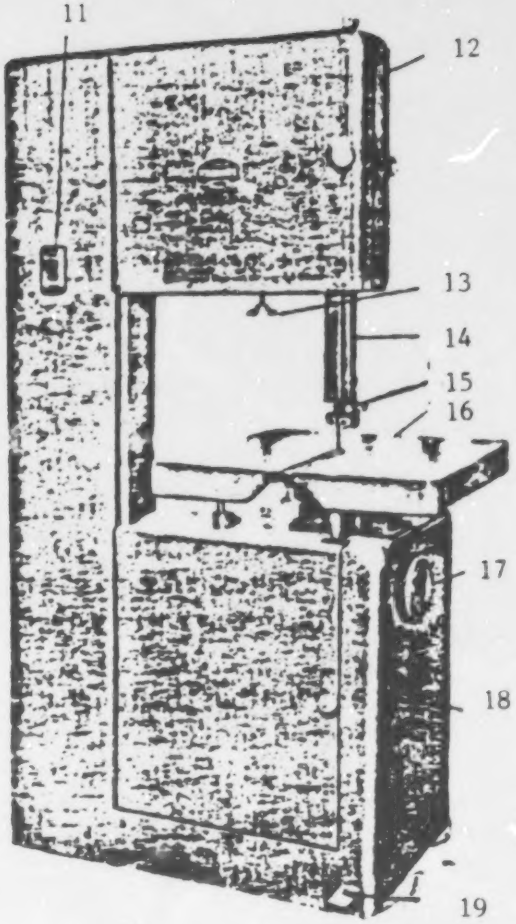
DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering the True or False items below using a separate sheet of paper.

1. The safety margin around the blade is 4 inches.
2. All adjustments must be made with the power disconnected.
3. The blade guide should be lowered to at least 1/6" above the work.
4. The stock should be feed into the wood evenly and slowly so that it will not twist or crowd the blade.
5. Keep fingers at least one inch from the blade when cutting.
6. Always back the saw out of oblong cuts.
7. While using the band saw you should keep your full attention on the work.
8. Make sure the stock has at least one flat surface before you place it against the table.
9. The power should be left on while changing the blade.
10. If the blade should break while cutting a board, turn the band saw off and inform the instructor.



a. Upper wheel guard

b. Switch

c. Sliding bar or post

d. Tension control knob

e. Table tilt handle

f. Table

g. Brake

h. Lower wheel guard

i. Guide wheel

BEST COPY AVAILABLE

SELF-CHECK FOR ENABLING OBJECTIVE 1 ANSWER KEY

number

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

True-False

1. True
2. True
3. False
4. True
5. False
6. False
7. True
8. True
9. False
10. True

Multiple Choice

11. b
12. a
13. d
14. c
15. i
16. f
17. e
18. h
19. g

All of your answers should agree with the answer on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE

2
number

PAGE 10 OF 16

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective

Identify common operations of a band or scroll saw.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify band and scroll saw operations.	1. Texts: a. Woodworking for Industry, Unit 31, "Band Saw" and Unit 32, "Jig or Scroll Saw", pages 366-380. b. Woodworking Tools Materials, Processes, Unit 30, "Band Saws", pages 270-282.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test
4. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 3.	

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SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 11 OF 16

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. Proper tracking is important to band saw operation?
2. Band saw tires are available in white side wall models, and include steel-belted radials.
3. Band saw tires prevent blade tooth damage.
4. The size of the wheel determines the size of the band saw.
5. A band saw blade should be installed with the teeth pointing forward and down.
6. Blade tension should be such that the blade has only 3/4" deflection when pushed on the side.
7. Relief cuts are made to prevent blade binding.
8. Compound sawing is a technique for making decorative pieces on the band saw.
9. A band saw is better for re-sawing than a table saw, because it removes less stock and makes the entire cut in one pass.
10. Narrow blades are usually used for re-sawing stock.
11. Guide clearance is best gauged with a piece of paper.
12. The table pivots on band saws, to allow bevel cuts.
13. Scroll saw blades should be of the largest size and with the coarsest teeth so that the stock will cut clearly and follow the lay-out line.
14. The hold-down should be just touching the surface of the stock.
15. Saber blades require fastening only in the upper chuck of the jigsaw.

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SELF-CHECK FOR ENABLING OBJECTIVE 2 number
ANSWER KEY

PAGE 12 OF 16

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

True-False

1. True
2. False
3. True
4. True
5. True
6. False
7. True
8. True
9. True
10. False
11. True
12. True
13. True
14. True
15. False

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3

number

PAGE 13 OF 16

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using band saws.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your Job Plan Sheet.	2. Job Plan Sheet.
3. Use Resource No. 3 to practice using the band saws.	3. a. Job Plan Sheet. b. Materials c. Band saw
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor inspect your work.	5. Instructor
6. When you think you can perform this task take the Performance Test.	6. Perform Test.

SELF-CHECK FOR ENABLING OBJECTIVE 3 number

PAGE 14 OF 16

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by answering the items below. All items should receive a "YES" response.

	YES	NO
1. Were safety practices followed at all times.	____	____
2. Was the saw set up, and checked. according to instructions, for the following: A. Blade direction B. Tracking C. Wheel guides D. Tension		
3. Were free-hand ups made to the line?	____	____
4. Were scroll cuts made properly and by pattern?	____	____
5. Were relief cuts made to prevent blade bending?	____	____
6. Was the student able to set up the band saw for a re-sawing operation?	____	____
7. Did the student have a working knowledge of component parts.	____	____

PERFORMANCE TEST FOR C | 2 0

duty | task number

PAGE 15 OF 16

DIRECTIONS:

Given access to a work station, materials, and a band saw, you will use a band saw. You will be evaluated for the attainment of this task based upon the items listed below.

Your performance will be assessed by your instructor using the Performance Test.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were safety practices followed at all times...........		
2. Was the saw set up, and checked, according to instructions, for the following: a. Blade direction b. Tracking c. Wheel guides d. Tension		
3. Were free-hand ups made to the line?.................		
4. Were scroll cuts made properly and by pattern?..		
5. Were relief cuts made to prevent blade bending?..		
6. Was the student able to set up the band saw for a re-sawing operation?.................		
7. Did the student have a working knowledge of component parts..................................		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

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DUTY

TASK

DEPT.

PROG.

Instructional Resources

Text

Spencer, W. P., Griffiths, S.D., Woodworking, Tools, Materials, Processes, American Technical Publishers, Alsip, IL 1981

Feirer, J.S., Woodworking for Industry, Charles A. Bennett Co., Inc., Peoria, IL 1979

KNOWLEDGE TEST FOR C | 2 | 0

duty task number

PAGE 1 OF 2

TASK: Use band saw and scroll saws.

DIRECTIONS:
Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

DUTY

TASK

DEPT.

PROG.

1. Hands and fingers should be kept outside the 2" safety margin around the blade.
2. Checking the blade tension and tooth direction before operating the band saw is a good safety practice.
3. All blade adjustments should be made with the saw disconnected from the power source.
4. The blade guide should be within 2" of the stock surface.
5. Never attempt to cut stock which does not have one flat surface to contact the table.
6. Turning the saw off before backing the blade out of cuts prevents blade breakage.
7. Band saw tires prevent blade damage.
8. The size of a band saw is determined by the length of the blade.
9. Band saws are superior to table saws for re-sawing stock.
10. Band saw blades are inistalled with teeth forward and pointing down.

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KNOWLEDGE TEST FOR C | 2 | 0

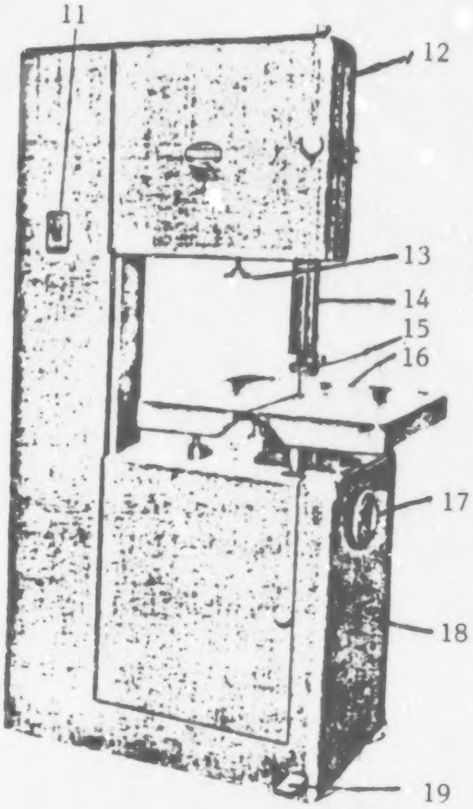
CONTINUED duty task number PAGE 2 OF 2

DUTY

TASK

DEPT.

PROG.



a. Tension control knob

b. Sliding bar or post

c. Table tilt handle

d. Sawer wheel guard

e. Switch

f. Guide wheels

g. Upper wheel guard

h. Table

i. Brake

C-20
Use band saw and scroll saws
Answer Key

True or False

1. False

2. True

3. True

4. False

5. True

6. True

7. True

8. False

9. True

10. True

Multiple Choice

11. E

12. G

13. A

14. B

15. F

16. H

17. C

18. D

19. I

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY 9163

DUTY: C COMPLETING CORE CURRICULUM

TASK: 3 4 Erect Scaffolding

PURPOSE:

Scaffolds are temporary platform structures that are used when working above the normal reach of a workman standing on the ground. They may be simple structures built by carpenters on the job or they may be the manufactured type. Regardless of the type, safety is of utmost importance. This learning guide will help you learn to construct scaffolding and develop a vocabulary of terms associated with scaffolding.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

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Riviera Beach, Florida 33404

South Technical Education Center
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The format used in this student learning guide is one of the products developed through a grant from the Division of Vocational Education, Florida Department of Education which designated Ridge Vocational-Technical Center as a state demonstration site for competency-based vocational education.

PERFORMANCE OBJECTIVE:

(Include condition, performance, and standard)

GIVEN: access to necessary tools, materials, and learning resources,

YOU WILL: build and erect scaffolding.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify scaffolding safety practices.
2. Identify types of scaffolding and uses.
3. Practice building and erecting scaffolding.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 4 OF 21

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify scaffolding safety practices.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify safety practices for scaffolding.	1. Instruction Sheet enclosed, Scaffolding Safety Rules.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

Scaffolding Safety Rules

Following are some common sense rules designed to promote safety in the use of steel scaffolding. These rules are illustrative and suggestive only, and are intended to deal only with some of the many practices and conditions encountered in the use of scaffolding. The rules do not purport to be all-inclusive or to supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. They are not intended to conflict with, or supersede, any state, local, or federal statute or regulation; reference to such specific provisions should be made by the user. (See Rule II.)

I. POST THESE SCAFFOLDING SAFETY RULES in a conspicuous place and be sure that all person who erect, dismantle or use scaffolding are aware of them.

II. FOLLOW ALL STATE, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS pertaining to scaffolding.

III. INSPECT ALL EQUIPMENT BEFORE USING—Never use any equipment that is damaged or deteriorated in any way.

IV. KEEP ALL EQUIPMENT IN GOOD REPAIR. Avoid using rusted equipment—the strength of rusted equipment is not known.

V. INSPECT ERECTED SCAFFOLDS REGULARLY to be sure that they are maintained in safe condition.

VI. CONSULT YOUR SCAFFOLDING SUPPLIER WHEN IN DOUBT—scaffolding is his business, NEVER TAKE CHANCES.

A. PROVIDE ADEQUATE SILLS for scaffold posts and use base plates.

B. USE ADJUSTING SCREWS instead of blocking to adjust to uneven grade conditions.

C. PLUM AND LEVEL ALL SCAFFOLDS as the erection proceeds. Do not force braces to fit—level the scaffold until proper fit can be made easily.

D. FASTEN ALL BRACES SECURELY.

E. DO NOT CLIMB A CROSS BRACES. An access (climbing) ladder, access steps, frame designed to be climbed or equivalent safe access to the scaffold shall be used.

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F. ON WALL SCAFFOLDS PLACE AND MAINTAIN ANCHORS securely between structure and scaffold at least every 30' of length and 25' of height.

G. WHEN SCAFFOLDS ARE TO BE PARTIALLY OR FULLY ENCLOSED, specific precautions must be taken to assure frequency and adequacy of ties attaching the scaffolding to the building due to increased load conditions resulting from effects of wind and weather. The scaffolding components to which the ties are attached must also be checked for additional loads.

H. FREE STANDING SCAFFOLD TOWERS MUST BE RESTRAINED FROM TIPPING by guying or other means.

I. EQUIP ALL PLANKED OR STAGED AREAS with proper guardrails, midrails and toeboards along all open sides and ends of scaffold platforms.

J. POWER LINES NEAR SCAFFOLDS are dangerous--use caution and consult the power service company for advice.

K. DO NOT USE ladders or makeshift devices on top of scaffolds to increase the height.

L. DO NOT OVERLOAD SCAFFOLDS.

M. PLANKING:

   1. Use only lumber that is properly inspected and graded as scaffold plank.

   2. Planking shall have at least 12" of overlap and extend 6" beyond center of support, or be cleated at both ends to prevent sliding of supports.

   3. Fabricated scaffold planks and platforms unless cleated or restrained by hooks shall extend over their end supports not less than 6 inches nor more than 12 inches.

   4. Secure plank to scaffold when necessary.

N. FOR ROLLING SCAFFOLD THE FOLLOWING ADDITIONAL RULES APPLY:

   1. DO NOT RIDE ROLLING SCAFFOLDS.

   2. SECURE OR REMOVE ALL MATERIAL AND EQUIPMENT from platform before moving scaffold.

3. CASTER BRAKES MUST BE APPLIED at all times when when scaffolds are not being moved.

4. CASTERS WITH PLAIN STEMS shall be attached to the panel or adjustment screw by pins or other suitable means.

5. DO NOT EXTEND ADJUSTING SCREWS ON ROLLING SCAFFOLDS WITHOUT SUFFICIENT HELP-- watch out for holes in floor and overhead obstructions.

6. DO NOT EXTEND ADJUSTING SCREWS OH ROLLING SCAFFOLDS MORE THAN 12".

7. USE HORIZONTAL DIAGONAL BRACING near the bottom and at 20' intervals measured from the rolling surface.

8. DO NOT USE BRACKETS ON ROLLING SCAFFOLDS without consideration of overturning effect.

9. THE WORKING PLATFORM HEIGHT OF A ROLLING SCAFFOLD must not exceed four times the smallest base dimension unless guyed or otherwise stabilized.

O. For "PUTLOGS" and "TRUSSES" the following additional rules apply.

1. DO NOT CANTILEVER OR EXTEND PUTLOGS/TRUSSES as side brackets without thorough consideration for loads to be applied.

2. PUTLOGS/TRUSSES SHOULD EXTEND AT LEAST 6" beyond point of support.

3. PLACE PROPER BRACING BETWEEN PUTLOGS/TRUSSES when the span of putlog/truss is more than 12".

P. ALL BRACKETS shall be seated correctly with side brackets parallel to the frames and end brackets at 90 degrees to the frames. Brackets shall not be bent or twisted from normal position. Brackets (except mobile brackets designed to carry materials) are to be used as work platforms only and shall not be used for storage of material or equipment.

Q. ALL SCAFFOLDING ACCESSORIES shall be used and installed in accordance with the manufacturers recommended procedure. Accessories shall not be altered in the field. Scaffolds, frames and their components, manufactured by different companies shall not be intermixed.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 8 OF 21

DUTY

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PROG.

DIRECTIONS:

Evaluate your knowledge answering True or False to the items below using a separate sheet of paper.

1. Blocking should be used to correct uneven grade conditions.
2. All scaffolds should be plumbed and leveled as erected.
3. Braces can be safely used for climbing.
4. Open sides and ends of scaffolding should be equipped with proper guardrails, midrails, and toeboards.
5. The use of ladders or step stools on scaffolding is a poor safety practice.
6. Scaffold planking should have a 9" minimum overlap.
7. Riding rolling scaffolding is an approved safety practice.
8. Caster brakes should be applied at all times when scaffolds are not being moved.
9. The working height of rolling scaffolding must not exceed 4 times the smallest base dimension unless some method of stabilization is used.

Now check your answers with the Answer Key.

1. False
2. True
3. False
4. True
5. True
6. False
7. False
8. True
9. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 10 OF 21

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective

Identify types of scaffolding and uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify scaffolding types and uses.	1. a. Text: Modern Carpentry, pages 542-549 b. Text: Carpentry and Building Construction, pages 216-225. c. Instruction Sheet enclosed, Erecting a Double Post Scaffold d. Instruction Sheet enclosed, Erecting a Single Post Scaffold
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test.
4. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 3	

Erecting a Double Post Scaffold

Tools and Equipment: Hammer, framing square, wrench, crosscut saw, and 6' rule.

We will erect a double-post scaffold using seven uprights spaced 7' apart (a normal range of 6'-8'). 18" long 2x4's will be used for the uprights.

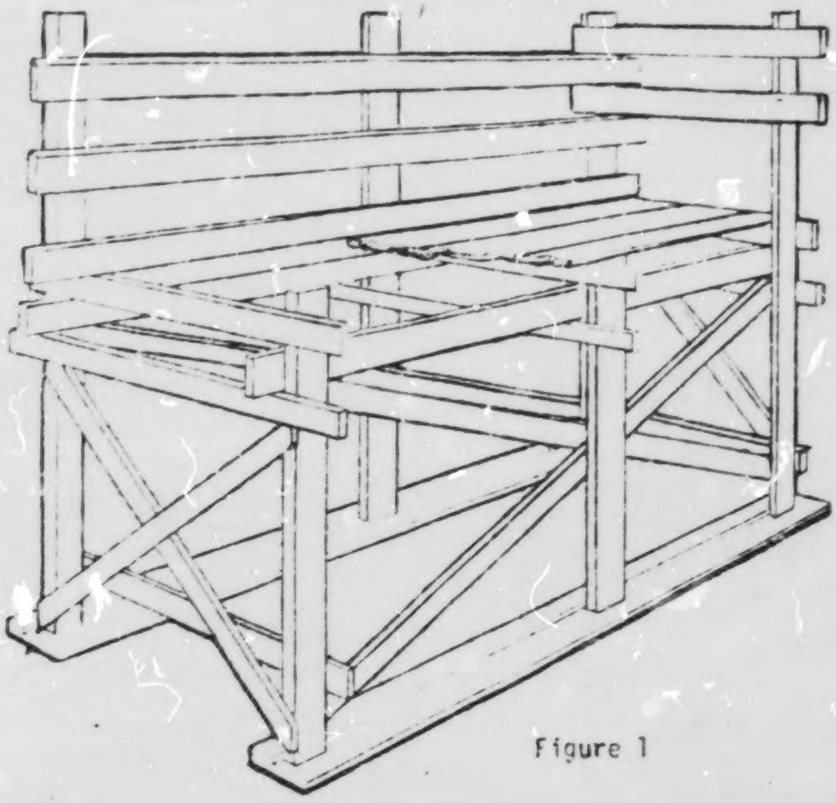

Figure 1

Safety precautions must be exercised in the construction of a scaffold. The safety factor ratio recommended for scaffold construction is four to one. This means that the scaffold has to support four times the load for which it is intended. Also, the lumber selected for the scaffold must be straight grain and be free from stakes and knots.

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1. Place the 18' upright about 6' from the building and the other upright 4' outside the first one.

2. Measure a distance of 6' from the bottom of each post.

3. Use four 10d nails to fasten the ledger board to each of the posts.

4. Nail on the diagonal braces (use 1 x 6 stock) across the top of the two uprights to ensure that the posts are parallel.

5. Nail a 12' board on the upright, directly under the ledger board.

6. Construct another set of uprights in a similar manner.

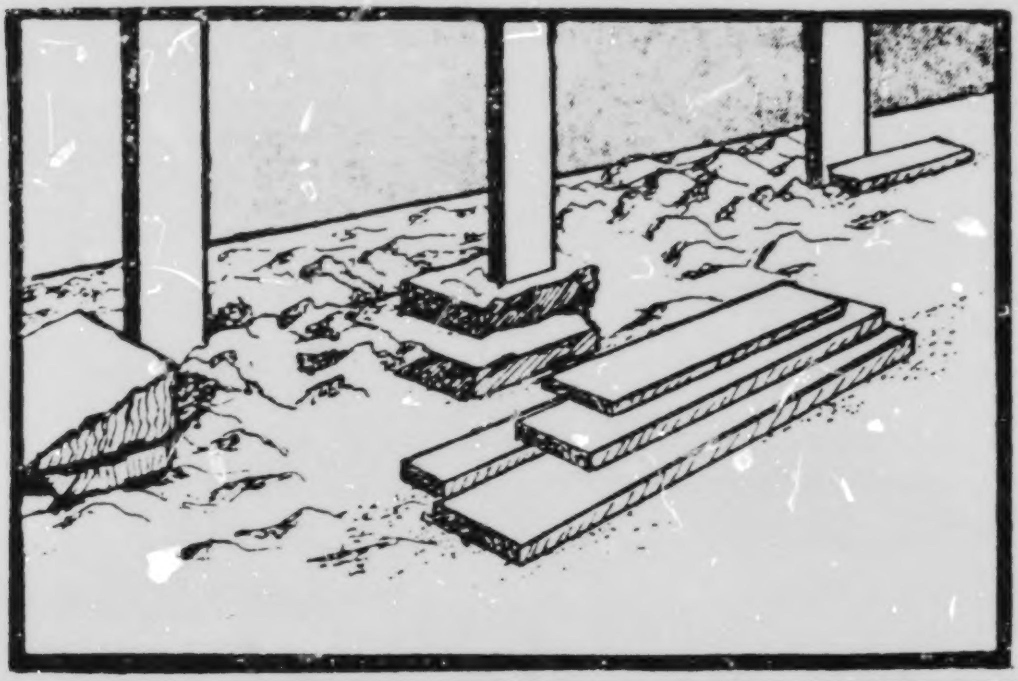
7. Put the two sets of uprights in place.

8. Brace the two uprights in the same manner as in a single-post scaffold.

9. Install the same type of brace for the inside posts.

10. Nail the guardrails, toe board and intermediate rail on the inside of the uprights. Use 2 x 4 boards.

11. The uprights are then set on sill plates so that they cannot settle or move out of plumb. Always set the scaffold on firm ground; never risk setting the uprights on a shabby base as shown in Figure 2.



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12. Construct the rest of the uprights in the same way.

13. Place 2 x 10 planks between cross-ledgers for walk boards. Most walk boards are two boards wide. Using just one board is extremely weak and too narrow for walking purposes. See Figure 3.

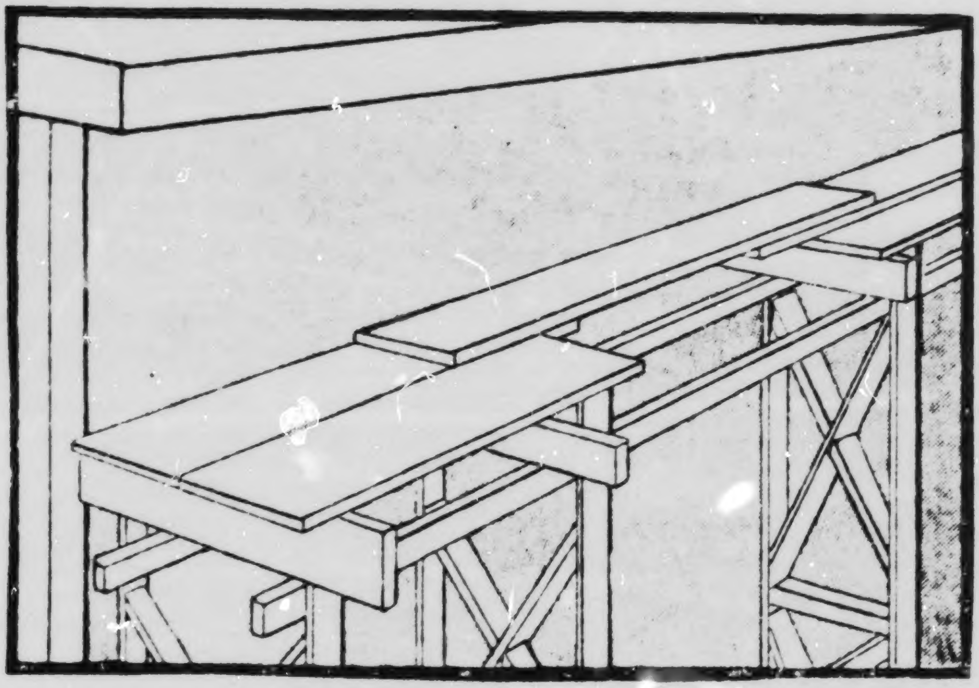

Figure 3

14. Follow the same procedures to extend the height of the scaffold. Allow a maximum of 7' 6" between the walk boards.

15. Brace the end uprights to the end of the building.

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DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Erecting a Single-Post Scaffold

Tools and Equipment: Hammer, framing square, wrench, crosscut saw, and 6' rule.

We will erect a single-post scaffold using seven uprights spaced 7' apart (normal range of 6' 3'). 18' long 2 x 4"s will be used for the uprights.

Safety precautions must be exercised in the construction of a scaffold. The safety factor ratio recommended for scaffold construction is four to one. This means that the scaffold has to support four times the load for which it is intended. Also, the lumber selected for the scaffold must be straight grain and be free from stakes and knots. Refer to the drawing of a single-post scaffold on page 2 of this Instruction Sheet (Figure 4).

1. Measure a distance of 6' on the 2 x 4 upright.
2. Nail four 10d nails on a 1" x 6" x 4' ledger board to the upright. Use a framing square to make sure the ledger board is square with the upright.
3. Nail a 12" board on the upright, directly under the ledger board.
4. Measure up 6' from the ground along a stud on the building.
5. Use this mark to nail a 2" x 4" x 18" stock on the building with three 20d nails. Make sure the nails go through the sheathing into the stud.
6. Stand the upright in place.
7. Nail the ledger board to the side of the 2 x 4 on the building.
8. Install the other upright in the same manner.
9. Nail the diagonal braces (use 1 x 6 stock) with 10d nails.
10. Place 2 x 10 planks between the cross ledger to serve as walk boards.
11. Nail in 2 x 4 boards on the upright to serve as the toe board, intermediate rail and guard rail.
12. Place blocks under the posts if the ground is soft. This will prevent the post from sinking into the ground.
13. The scaffold can be extended another 6' in the same manner, if necessary. Refer to Figure 4 for the drawing of a single-post scaffold.

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 2 number PAGE 15 OF 21

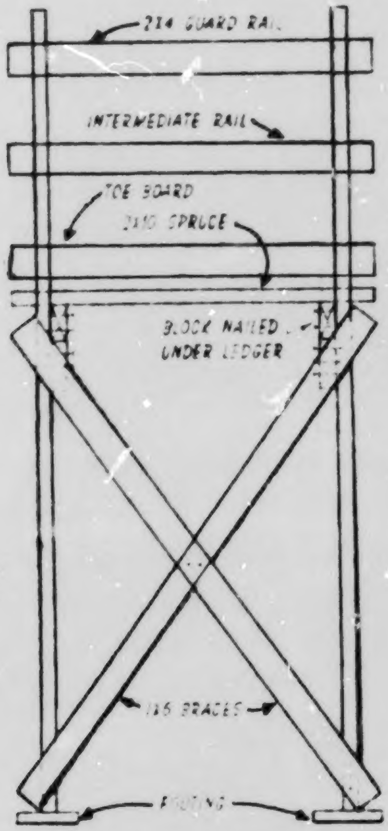
DUTY

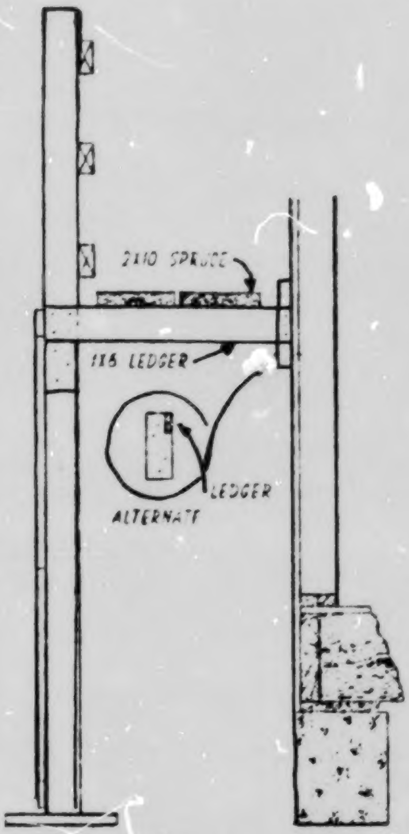
TASK

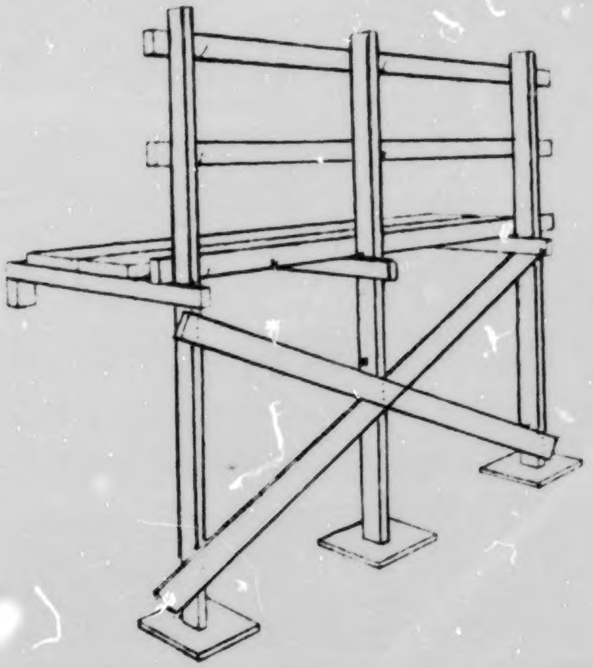
EN. OBJ.

DEPT.

PROG.


2X4 GUARD RAIL
INTERMEDIATE RAIL
TOE BOARD
2X10 SPRUCE
BLOCK NAILED UNDER LEDGER
1X6 BRACES
FOOTING


2X10 SPRUCE
1X6 LEDGER
LEDGER
ALTERNATE



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SELF-CHECK FOR ENABLING OBJECTIVE 2 number

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. The safety factor ratio for scaffolding is 4 to 1.
2. Scaffolding lumber must be straight grain and free from stakes and knots.
3. Scaffold uprights should be set on sill plates that cannot settle or move out of a plumb.
4. One walk board is of adequate width for a safe working area.
5. A ladder jack is a scaffolding appliance for use on ladders.
6. Manufactured metal scaffolding is both safe and adaptable for many uses.
7. Roofing brackets are used for scaffolding an steep roofs.

SELF-CHECK FOR ENABLING OBJECTIVE ANSWER KEY

2
number

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DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. True
2. True
3. True
4. False
5. True
6. True
7. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3 number PAGE 18 OF 21

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Enabling objective

Practice building and erecting scaffolding.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have the instructor check your work.	2. Job Plan Sheet
3. Using Resource No. 3, practice building and erecting scaffolding.	3. a. Prepared Job Plan b. Tools c. Materials
4. Complete the Self Check.	4. Self-Check enclosed.
5. Have the instructor check your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test

SELF-CHECK FOR ENABLING OBJECTIVE 3

number

PAGE 19 OF 21

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your work by answering the items below.
All items should receive a YES response.

	YES	NO
1. Were safety rules strictly followed?.....	____	____
2. Were proper size numbers selected?.......	____	____
3. Were sills used?........................	____	____
4. Was nail size selected to fit the task?..	____	____
5. Were walk boards lapped and the correct size.................................	____	____
6. Was the student able to identify the scaffolding for:		
a. Roof work?.........................	____	____
b. Double - pole scaffolding?..........	____	____
c. Single - pole scaffolding?..........	____	____
d. Manufactured scaffolding?..........	____	____
e. Rolling scaffolding?................	____	____

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PERFORMANCE TEST FOR C | 3 | 4

duty · task number

PAGE 20 OF 21

DIRECTIONS:

Given access to necessary tools and material, you will build and erect scaffolding. You will be evaluated for attainment of this task based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were safety rules strictly followed?		
2. Were proper size numbers selected?		
3. Were sills used?		
4. Was nail size selected to fit the task?		
5. Were walk boards lapped and of correct size		
6. Was the student able to identify the scaffolding for:		
a. Roof work?		
b. Double - pole scaffolding?		
c. Single - pole scaffolding?		
d. Manufactured scaffolding?		
e. Rolling scaffolding?		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained

☐ Not attained

EVALUATOR

DEPT.

PROG.

Instructional Resources

Texts

Feirer, John L., Hutchings, Gilbert R., Carpentry and Building Construction, Bennett Publishing Company, Illinois, 1976.

Wagner, Willis H., Modern Carpentry, Goodheart - Willcox Publishing Company, Illinois, 1979.

KNOWLEDGE TEST FOR C | 3 4

duty task number

PAGE 1 OF 2

DUTY

TASK

DEPT

PROG.

TASK Erect Scaffolding

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.
Do not write on this test!

1. Blocking should be used to correct uneven grade conditions.

2. All scaffolds should be plumbed and leveled as erected.

3. Braces can be safely used for climbing.

4. Open sides and ends of scaffolding should be equipped with proper guardrails, mid rails, and toe boards.

5. The use of ladders or step stools on scaffolding is a poor safety practice.

6. Scaffold planking should have a 9" minimum overlap.

7. Riding rolling scaffolding is an approved safety practice.

8. Caster brakes should be applied at all times when scaffolds are not being moved.

9. The working height of rolling scaffolding must not exceed 4 times the smallest base dimension unless some method of stabilization is used.

10. The safety factor ratio for scaffolding is 4 to 1.

11. Scaffolding lumber must be straight grain and free from and knots.

12. Scaffold uprights should be set on sill plates that cannot settle or move out of plumb.

13. One walk board is of adequate width for a safe working area.

14. A ladder jack is a scaffolding appliance for use on ladders.

15. Manufactured metal scaffolding is both safe and adaptable for many uses.

16 Roofing brackets are used for scaffolding an steep roofs.

C-34
Erect Scaffolding
Answer Key

1. False
2. True
3. False
4. True
5. True
6. False
7. False
8. True
9. True
10. True
11. True
12. True
13. False
14. True
15. True
16. True

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM:		CARPENTRY 9163
DUTY:	C	COMPLETING CORE CURRICULUM
TASK:	3 3	Build Sawhorses

PURPOSE:

Sawhorses are a basic component of carpentry equipment. They are used to support materials that are being cut and formed. Since many materials are heavy, the sawhorses must be sturdy and capable of supporting a load without wobbling. This learning guides will enable you to build a pair of sturdy sawhorses.

DUTY
TASK
PREREQ
DEPT.
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THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

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The format used in this student learning guide is one of the products developed through a grant [illegible] the Division of Vocational Education, Florida Department of Education which designated Ridge Vocational-Technical Center as a state demonstration site for competency-based vocational education.

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PERFORMANCE OBJECTIVE:
(Include condition, performance,
and standard)

GIVEN: access to the necessary tools, materials, and a work station.

YOU WILL: build sawhorses.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify the steps in building sawhorses.
2. Practice building sawhorses.

EARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number

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nabling objective

Identify the steps in building sawhorses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Read Resources No. 1 to identify materials and tools needed for sawhorse construction.	1. Instruction Sheet enclosed, Materials and Tools Needed for Sawhorse Construction
2. Read Resource No. 2 to identify steps in sawhorse construction.	2. Instruction Sheet enclosed, Steps in Sawhorse Construction
3. Complete the Self-Check.	3. Self-Check enclosed.
4. When you think you can attain this task, take the Knowledge Test.	4. Knowledge Test.
5. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 2.	

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 1 number PAGE 5 OF 15

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Materials and Tools Needed for Sawhorse Construction

To build fixed sawhorses you will need the following materials and tools.

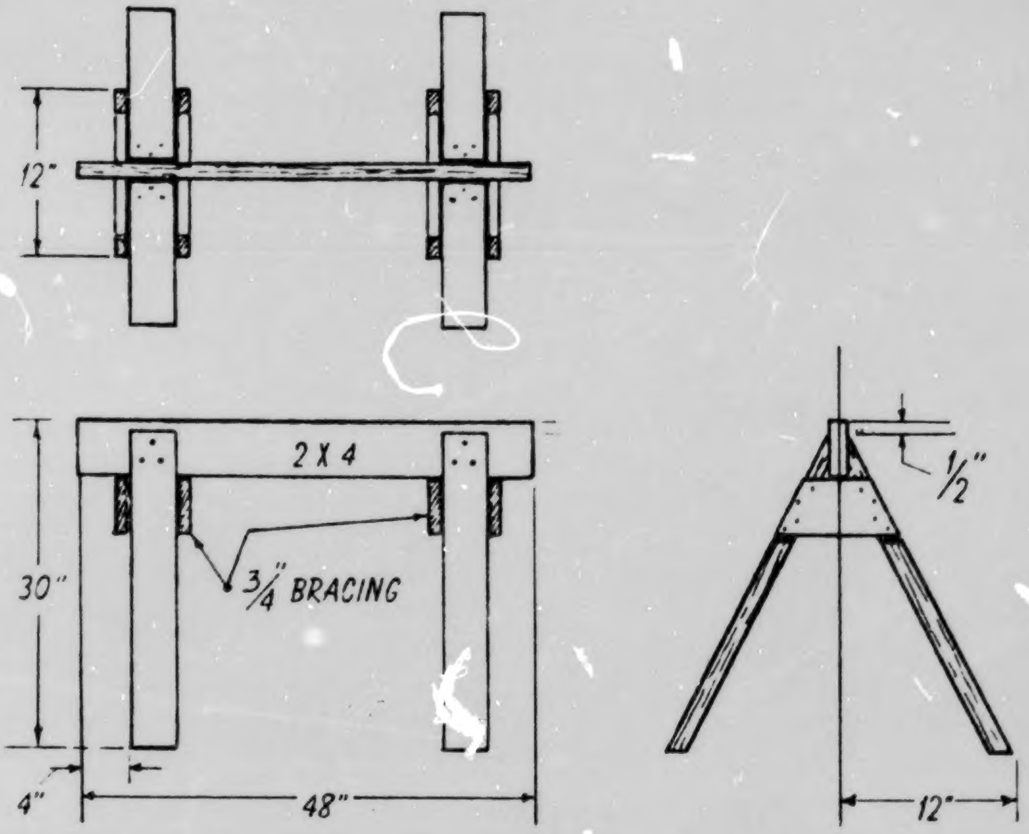
Material Needed:
1 - 8' 1" x 4"
1 - 8' x 2" x 4"
2 - 12' x 2" x 4"
24 - #1 box coated nails
64 - #8 box coated nails

Tools Needed:
16 oz. hammer
carpenter's framing square
8 point cross-cut hand saw and 6' folding rule
square clamps

Steps in Sawhorse Construction

To construct the sawhorses follow these steps:

1. Study multi-view drawing below.
2. Cut stock to length needed.
   a. Cut two 48" pieces from the 8' x 2" x 4" to use as backs of the sawhorses.
   b. Cut eight 32" legs from the 12' x 2" x 4" to use for legs on the sawhorses.
   c. Cut eight 12" braces from the 8' x 1" x 4", to be cut to fit later.



THREE-VIEW DRAWING OF SAWHORSE

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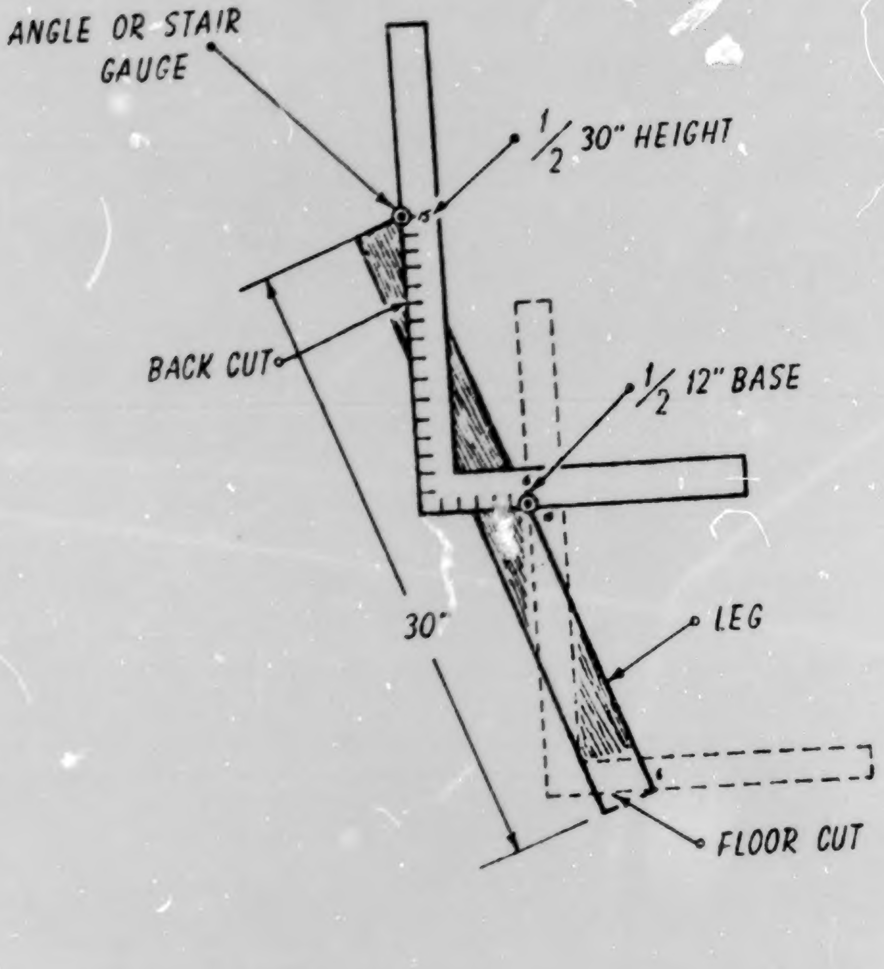
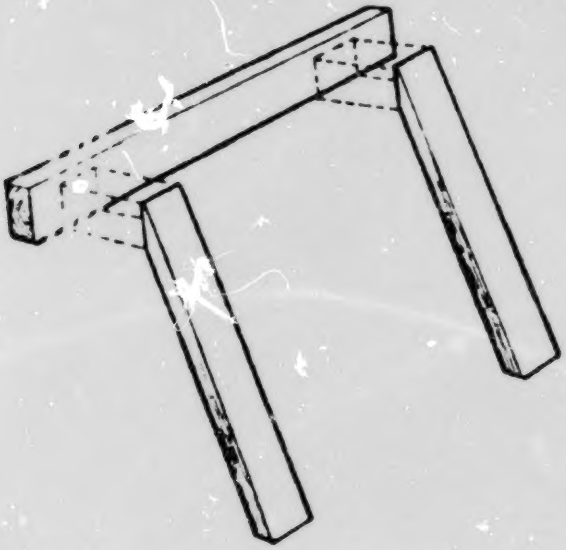
3. Mark cutting lines.

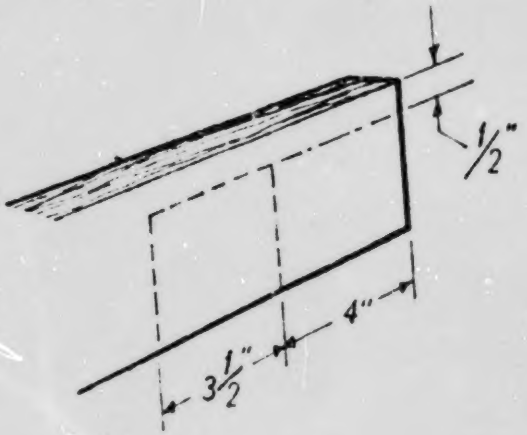
   a. Mark cutting lines on legs to fit the back and floor.

   b. Secure square clamps to the square and mark the cutting lines for the back cut and floor cut. (See drawing below.)


ANGLE OR STAIR GAUGE
1/2 30" HEIGHT
BACK CUT
1/2 12" BASE
30"
LEG
FLOOR CUT

4. Mark the position of the legs on the back and secure one leg to each position on both backs with one # 10 nail. (see drawings below.)

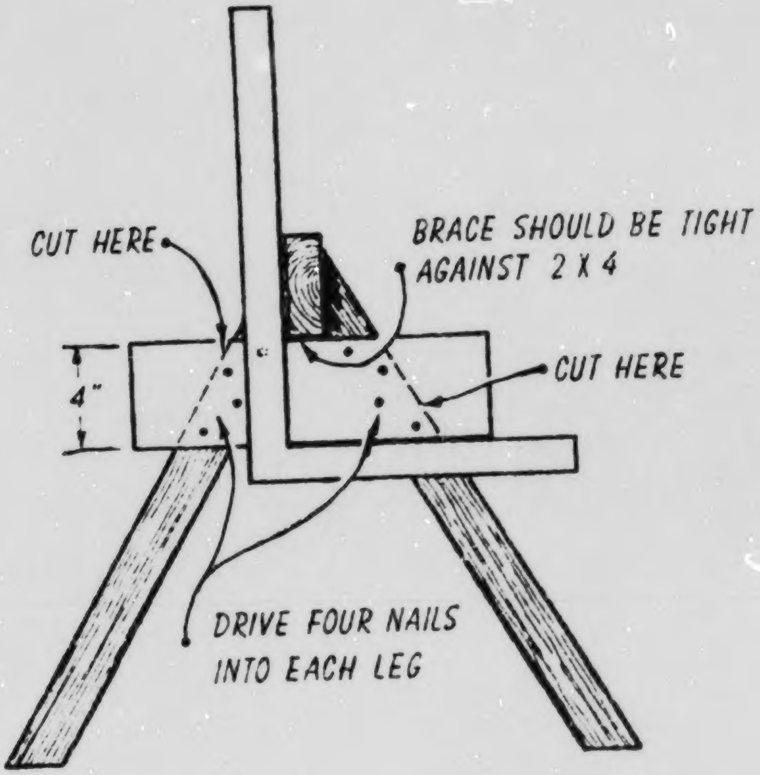




5. Stand the horses in their upright position and adjust the legs until each leg fits the floor, the back is level, and the legs are straight. (One nail in each leg will allow these adjustments if everything else is correct.) If these adjustments cannot be made, check your work up to this point and correct any mistakes that have been made by nailing, re-sawing, etc.

6. Finish nailing the legs to the back with two more # 10 box coated nails in each leg.

7. Cut eight braces and nail to the legs with four #8 box coated nails through each brace into the legs. You will use 16 nails per brace. (See illustration below.)


CUT HERE
BRACE SHOULD BE TIGHT AGAINST 2 X 4
4"
CUT HERE
DRIVE FOUR NAILS INTO EACH LEG

CAUTION: While assembling the sawhorses, do not drive nails within 1" of the top of the back or in the back. These nails would dull the tools you use when shaping materials supported on the sawhorses.

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SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 10 OF 15

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DIRECTIONS:

Evaluate your knowledge by answering the items below on a separate sheet of paper.

1. Sawhorses are constructed of 1" x 4" stock.
2. A framing square is used to determine the back cut and the floor cut.
3. The back cut is determined by using 15" on the body of the square, and 6" on the tongue of the square.
4. The brace should be tight against the 2" x 4" back.
5. The brace should be square with the 2" x 4" back.
6. There should be no nails within 1" of the top of the sawhorses' back.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

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1. False
2. True
3. True
4. True
5. True
6. True

All your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE

2
number

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DUTY
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Enabling objective:

Practice building sawhorses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment of building sawhorses.	1. Instructor
2. Prepare a job plan sheet. Have your instructor check your work.	2. Job Plan Sheet
3. Using Resource No. 3, practice building a pair of sawhorses.	3. a. Prepared Job Plan Sheet b. Tools c. Materials
4. Complete the Self-Check.	4. Self-Check enclosed.
5. Have your instructor check your work.	5. Instructor
6. When you think you can perform this task, take the Performance Test.	6. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 13 OF 15

DUTY

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PROG.

DIRECTIONS:

Evaluate your work by answering the items below. All items should receive a "YES" response.

	YES	NO
1. Were all joints adequately nailed for maximum strength?....................................	____	____
2. Were all legs adequately braced?.............	____	____
3. Were all legs set at the required angle?.....	____	____
4. Were all legs set level with the floor?......	____	____
5. Was the height designed for personal working comfort (usually 30"), within a tolerance of ± 1 inch?.......................................	____	____

PERFORMANCE TEST FOR C | 3 | 3

duty task number

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DIRECTIONS:

Given access to tools and supplies, you will build sawhorses. You will be evaluated for attainment of this task based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were all joints adequately nailed for maximum strength?........		
2. Were all legs adequately braced?........		
3. Were all legs set at the required angle?........		
4. Were all legs set level with the floor?........		
5. Was the height designed for personal working comfort (normally 30") within a tolerance of ± 1 inch ?........		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained

☐ Not attained

EVALUATOR

DEPT.

PROG.

DUTY	TASK	DEPT.	PROG.

Instructional Resources

Text

No additional resources required.

KNOWLEDGE TEST FOR C (duty) 33 (task number)　　PAGE 1 OF 1

DUTY | TASK | DEPT. | PROG.

TASK: Build Sawhorses

DIRECTIONS:

Evaluate your knowledge by answering the items below.
DO NOT WRITE ON THIS TEST!

1. Sawhorses are used to support materials being formed or cut.
2. Weak or wobbly sawhorses are a safety hazard.
3. The back cut is determined by using 12" on [illegible] body of the square and 6" on the tongue.
4. Sawhorses are constructed of 2" x 4" stock.
5. A framing square is used to determine the back cut and the floor cut.
6. The brace should be held 1" from the 2" x 4" back.
7. The brace should be square with the 2" x 4" back.
8. There should be no nails within 1" of the top of the sawhorses' back.

C-33
Build Sawhorses
Answer Key

1. True
2. True
3. False
4. True
5. True
6. False
7. True
8. True

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

DUTY

TASK

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PROG.

PROGRAM: CARPENTRY

DUTY: C Completing Core Curriculum

TASK: 0 7 Use Drilling and Boring Tools

REVISED

PURPOSE:

Many aspects of carpentry involve making round holes in various building materials. The fastest and most accurate way to accomplish this is through the use of drilling and boring tools. This Learning Guide will assist you in the development of drilling and boring skills.

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OBJECTIVES

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DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(include condition, performance,
and standard)

GIVEN: access to work station, tools, and building materials.

YOU WILL: learn to drill and bore building materials.

HOW WELL: You will successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test on page

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ENABLING OBJECTIVES:

1. Identify drilling tools and their uses.
2. Identify boring tools and their uses.
3. Practice using drilling and boring tools.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1 number

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DUTY | TASK | EN. OBJ. | DEPT. | PROG.

Enabling objective:

Identify drilling tools and their uses.

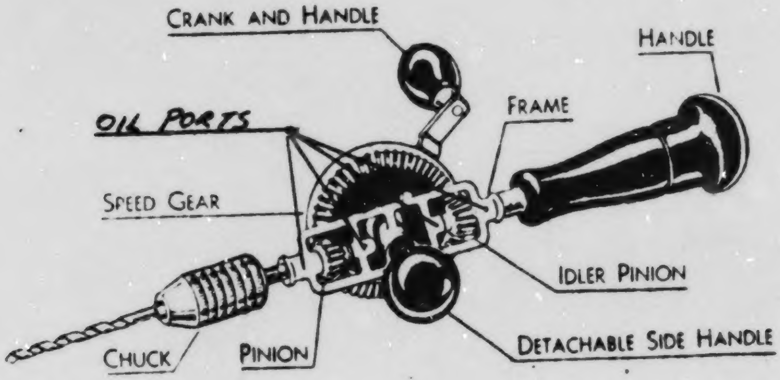
PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify drilling tools and their uses.	1. Instruction Sheet enclosed, Drilling Tools and their Uses.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

3

Drilling Tools and Their Uses

For the purpose of this Learning Guide, drilling tools will be classified as those which use drill bits. Both electrical and hand-powered drills will be included in this learning guide.



1. The Hand Drill

The hand drill is used for the rapid drilling of small holes in both wood, metal, and plastic. It is especially handy when an electrical source is not readily accessible to the work site, or a limited number of holes to be drilled makes the use of a hand drill more practical than running extension cords. The parts of a hand drill are shown in the illustration below.

Maintenance should consist of light machine oil in the oil parts, grease, such as litheum or petroleum jelly, on the gear surfaces, and possibly, as wear occurs, adjustment of speed gear and pinion clearance. Hand drills, as all other tools, should be kept clean and free of dirt or grit. Excess grease and oil should be removed, and old grease should be removed when it becomes dirty, because it may stain unfinished wood surfaces. Hand drills used in trim work should be kept especially clean to protect carpet, drapes, or any such thing which might come in contact with the drill.

A little-known feature of hand drills is that they have a removable top on the handle, and come with an assortment of drill points stored inside of the handle. Those drill points should only be used on wood or plastic, and never on metal because it dulls them.

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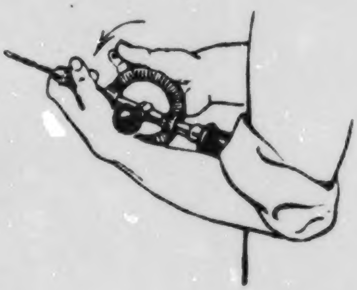
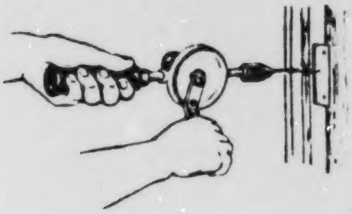
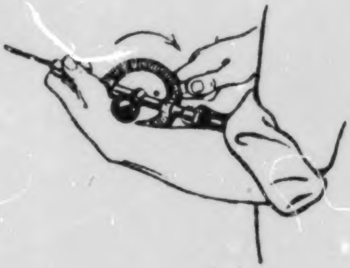
The drill is used in the following manner:

A. To place the drill in the drill in the chuck, open it only slightly more than the diameter of the drill. This helps to center it.
Insert the drill, tighten the chuck by pushing forward on the crank with the right hand, while holding the chuck shell tight with the left thumb and forefinger.





B

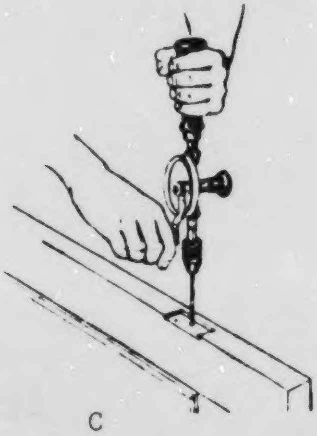


A

To remove the drill, hold the chuck shell tight with the left thumb and forefinger, and turn the crank backward, with the right hand, as shown by the arrow.

B. Hold the drill straight. Do not wobble while turning, it makes the hole over size and is likely to break the drill.

C. Hold the drill steady in the direction desired and exert an even pressure. Turn the crank at a constant speed and not too fast.



C

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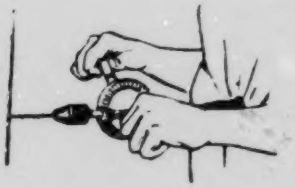
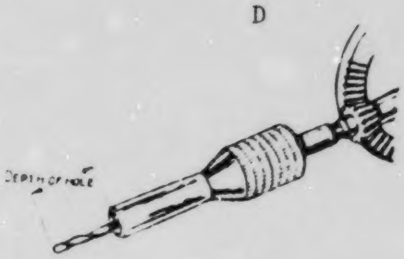
D. It is some times desirable to hold the drill by the side handle and press the body against the frame handle like a breast drill.



D

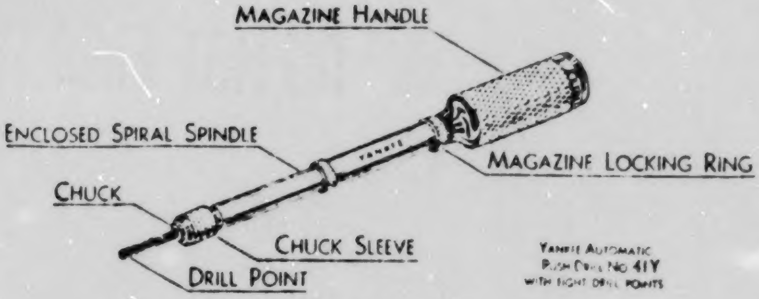
E. Holes in wood should be started with an awl to help center and locate the drill. Holes in metal should be center punched. When drilling through metal, relieve the pressure slightly before breaking through, to avoid breaking the drill. Twist drills principally for metal are made in a vast range of sizes.



E

F. To drill holes of uniform depth, make a depth gauge. Cut a piece of wood or dowel the right length so the drill will project the desired depth. When the piece of wood is drilled, slip it over the drill.

2. The Automatic Drill

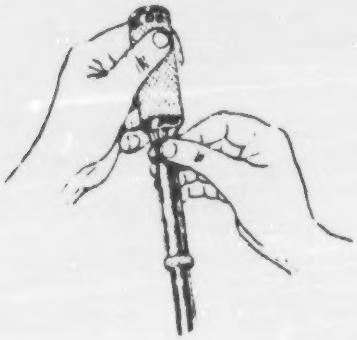


YANKEE AUTOMATIC
PUSH DRILL No 41Y
WITH EIGHT DRILL POINTS

The automatic, or "Yankee" drill is another tool which makes the drilling of small holes in places not necessarily convenient to electricity much simpler. The parts of the automatic drill are shown above. As in the hand drill, maintenance consists of cleaning and lubricating. A drop of light machine oil applied in such a manner that it runs into the chuck sleeve, and a light lubricant on the enclosed spiral spindle are sufficient for smooth operation. All excess should be removed, and the tool should be kept clean enough not to soil wood and fabrics inside homes.

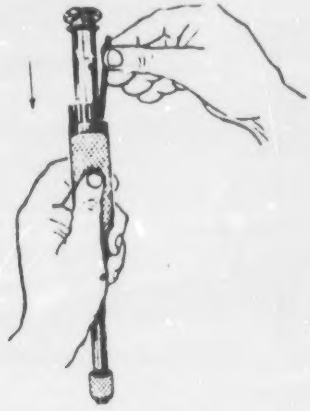
The automatic drill is used in the following manner:

A



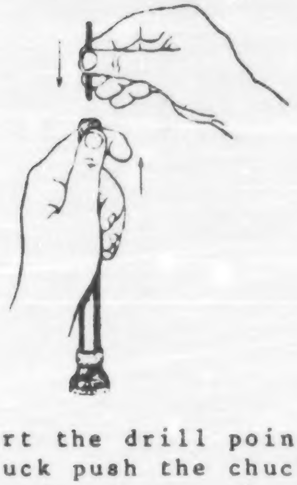
A. To open the magazine handle turn the locking ring to the left.

B



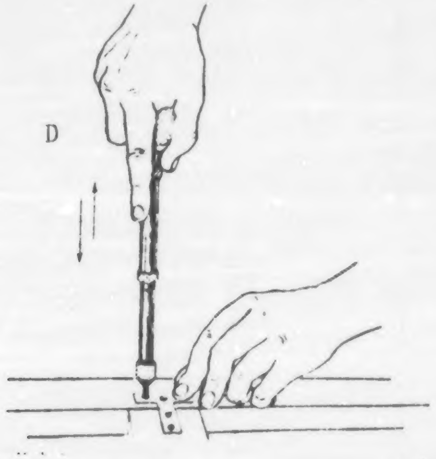
B. Draw the magazine handle down and turn it to select the desired size drill point. The magazine contains eight drill points, 1/16" to 11/64".

C



C. To insert the drill point into the chuck push the chuck sleeve forward. Insert the drill point and turn it until you feel it is seated. Release the chuck sleeve.

D



D. The Yankee automatic push drill is a tool to use with one hand, leaving the other one free to hold the work.

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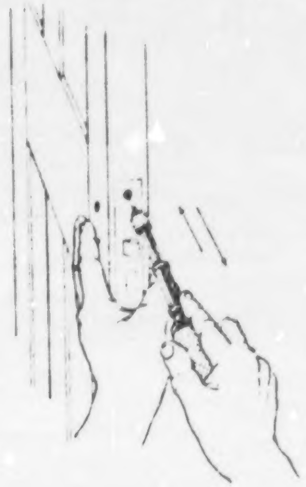
The drill is operated by pushing towards the object being drilled, and releasing pressure, so that the return spring pushes the handle and the hand away, when the botton is reached.

E. The return spring reverses the drill point, clearing away the chips. The automatic push drill is especially useful in awkward or closed places.

E



3. Types of Drill Bits

A. THE STRAIGHT-SHANK TWIST DRILL

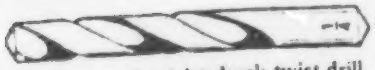


Fig. 1 Straight-shank twist drill.

The straight-shank twist drill, Figure 1, is used in the hand drill or breast drill for drilling holes in wood or metal. The size of a straight-shank twist drill is given in one of three ways: by a fraction (in increments of 1/64 inch); by a number; or by a letter which is stamped on the shank.

The fraction designation is the actual diameter of the drill. The number or letter only identifies the drill. The sizes of number and letter sized drills can be found on a chart or drill gauge. These sizes are given in decimals of an inch. For example, a drill with the letter W stamped on its shank is 0.386 inch in diameter, and a number 10 drill is 0.166 inch in diameter. Numbered drills range from 1 (0.338 inch) through 80 (0.0135 inch). Lettered sizes range from A (0.234 inch) through Z (0.413 inch). Note that the numbered drills are the smaller sizes and the letter sizes start where the numbered sizes end.

Starting a Twist Drill

1. Lay out intersecting lines to locate where the hole is to be drilled.
2. Use a center punch and hammer to make an impression in the surface. A scratch awl can be used for this purpose if wood is to be drilled.
3. Fit the point of the drill in the impression and start drilling.

Sharpening a Straight-Shank Twist Drill

NOTE: Sharpening this type of drill must be done on a grinder.

1. With the tool rest adjusted on a horizontal plane, scribe 59-degree lines on its face as shown in A, Figure 2. In this case the tool rest serves only as a reference point for sighting the angle at which to hold the drill and not as a support.

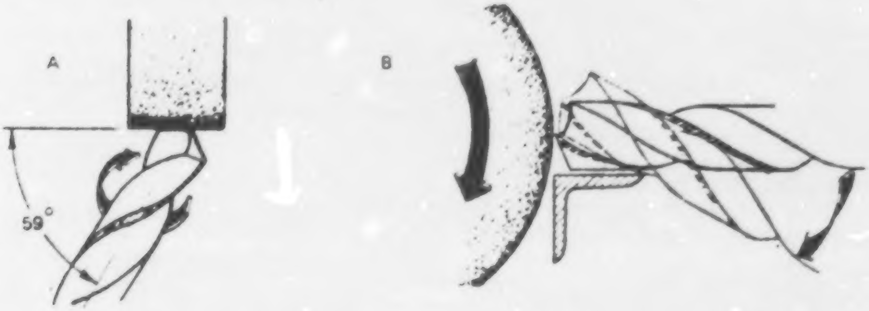


Figure 2 Sharpening a straight-shank twist drill.

2. Place one cutting edge (lip) against the face of the wheel at a 59-degree angle (A, Figure 2). As soon as the edge touches the grinder, raise the cutting edge and at the same time lower the shank end of the drill rotating it very slightly (B, Figure 2). This movement should produce the correct drill angles. (See Figure 3).

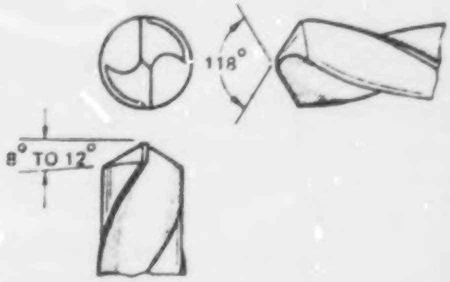


Fig. 3 Angles for grinding a straight-shank twist drill

NOTE: Keep the cutting edge on a horizontal plane throughout the grinding operation. Cool the drill often by dipping it in a can of water to avoid burning the cutting edges.

3. Grind the opposite cutting edge in the same way. The same amount of grinding should be done on each cutting edge so that the point of the drill will be centered.

4. Check the size (span) of each cutting edge with a steel scale graduated in sixty-fourths of an inch. Grind the longest edge until both edges are equal.

B. FORSTNER BIT

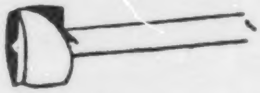


Figure 4

The Forstner bit, Figure 4, is a different type of bit. It has no screw, spurs, or twist. Cutting is done by two lips and a circular steel rim. Sizes of these bits range from 1/4 inch to 2 inches in diameter. They are numbered on the tang in the same way as an auger bit. For example, a number 6 Forstner bit is 6/16 inch or 3/8 in diameter. This bit is used to bore holes not possible with auger bits. Where a hole must be bored partway through the stock, the auger bit screw or spur can pierce through the stock. The Forstner bit, which has no screw or spur, prevents this from happening. This bit can also be used on end grain, thin wood, or near an end where an auger bit would split the work. Because it has no screw, it can be used to bore a larger hole where a smaller hole has already been bored without first plugging the smaller hole. When boring holes completely through, scrap stock should be clamped to the back to prevent splitting.

NOTE: The Forstner bit provides a smooth bottom to the bore, while the auger bit leaves the impression of the feedscrew and spurs. Since this type of bit has no screw, centering it is more difficult.

Starting a Forstner Bit

1. Lay out intersecting lines to locate the hole.

2. Scribe a circle the size of the hole using dividers. Go over the circle several times so that the dividers score the wood rather deeply.

3. Press the rim of the Forstner bit into the scribed circle.

4. Start to bore as with an auger bit.

Sharpening a Forstner Bit

NOTE: Only the cutting lips are sharpened on this type of bit.

1. Select a fine-cut flat file which will fit into the openings forming the bevels of the cutting lips. An auger bit file is suitable for this purpose.

2. File as described for filing the cutting lips of an auger bit.

C. THE AUTOMATIC DRILL BIT (FLUTED)

This type of bit, shown in Figure 5, is made especially for use with the automatic drill. However, it can be used in hand drill. The application of this bit is mainly for boring small holes in wood. It cannot be used to drill metal. Sizes are stamped on the shank and range from 1/16 inch to 11/64 inch in increments of sixty-fourths of an inch.

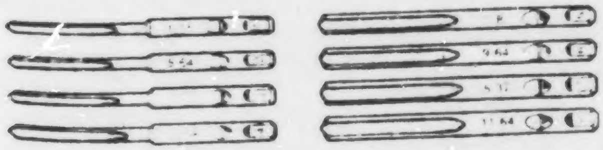


Fig 5 —Automatic drill bits.

D. COUNTERSINKS

Countersinks are used to seat the head of a flathead screw flush with the surface that is countersunk. These are made for both the bit brace and the hand drill. Observe that there are two distinct types which can be used with the hand drill (B and C, Figure 6). Type B cuts more rapidly, but produces a rough surface.

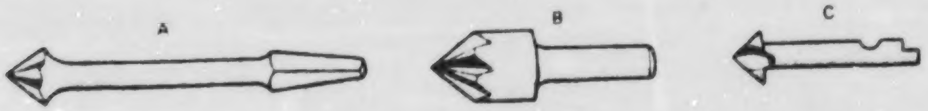


Fig. 6 Types of countersinks.

Countersinking is usually done after the hole has been drilled. A countersunk hole can be checked for size by holding the screw head up against the hole.

THE COMBINATION WOOD DRILL AND COUNTERSINK

This type of drill, shown in Figure 7, makes the pilot hole, shank clearance, and countersink to correct depth for woodscrews in one operation. It is suitable for use in a hand, breast, or power drill.

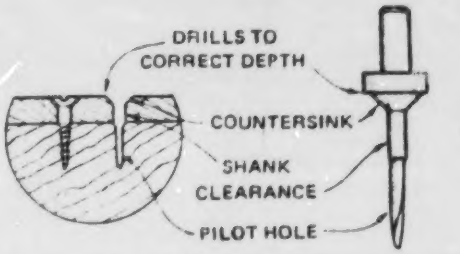


Fig. 7 Combination wood drill and countersink

A variety of sizes are made (ranging from 1/2 x No. 5 to 2 x No. 12) capable of drilling the holes necessary for driving the common sizes of screws used by carpenters. The size of the drill determines the size of the screw for which it is suited. For example, a 1/2 x No. 5 drill is used for a flathead woodscrew 1/2 inch long having a number 5 (about 1/8 inch) body size. A size 2 x No. 12 indicates that it is used for a screw 2 inches long having a number 12 (about 7/32 inch) body size.

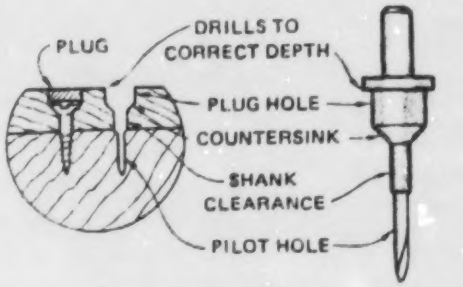


Fig. 8 Combination wood drill, countersink and counterbore

THE COMBINATION WOOD DRILL, COUNTERSINK, AND COUNTERBORE

This type of drill, shown in Figure 8, performs all the operations done by the combination wood drill and countersink, plus drilling holes for wood plugs (counterboring). It is made in a number of sizes ranging from 1 x No. 8 to 2 x No. 18. The significance of its size is similar to that of the combination wood drill and countersink.

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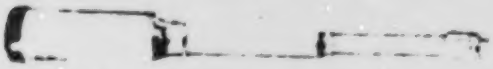
SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 14 OF 39

DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.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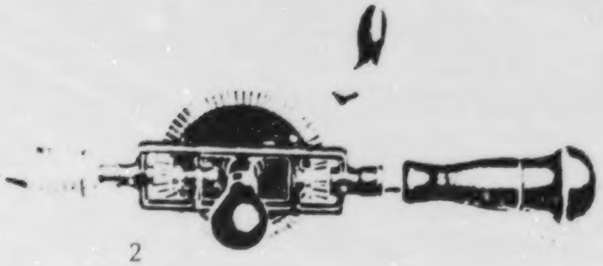
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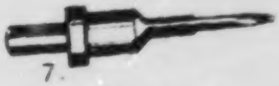
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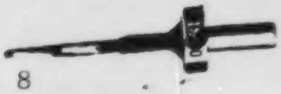
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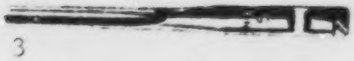
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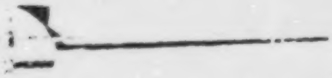
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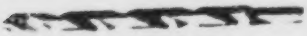
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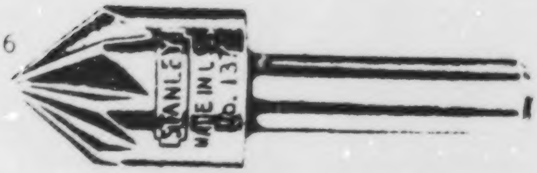


a. hand drill

b. combination wood drill and countersink

c. combination wood drill, countersink and counterbore

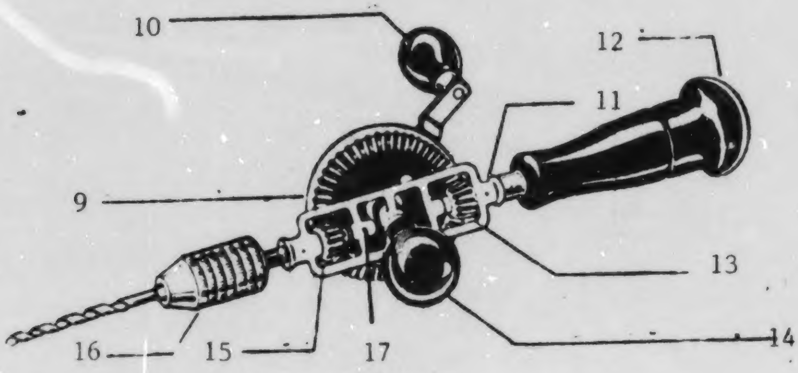
d. automatic drill point

e. Forstner bit

f. automatic drill

g. twist drill

h. countersink



STANLEY HAND DRILL NO 624 $\frac{3}{8}$ CHUCK

a. speed gear

b. idler pinion

c. frame

d. oil port

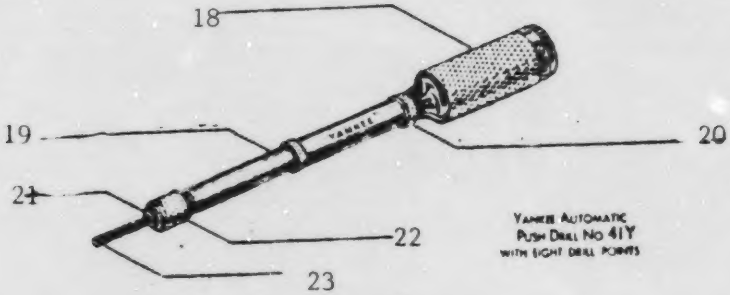
e. chuck

f. crank and handle

g. handle

h. pinion

i. side handle



YANKEE AUTOMATIC PUSH DRILL NO 41Y WITH EIGHT DRILL POINTS

j. chuck

k. spiral spindle

l. drill point

m. chuck sleeve

n. magazine locking ring

o. magazine handle

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SELF-CHECK FOR ENABLING OBJECTIVE 1
ANSWER KEY

number

PAGE 16 OF 39

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. f
2. a
3. d
4. e
5. g
6. h
7. c
8. b
9. a
10. f
11. c
12. g
13. b
14. i
15. h
16. e
17. d
18. o
19. k
20. n
21. j
22. m
23. l

All your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2

number

PAGE 17 OF 39

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify boring tools and their uses.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify boring tools and their uses.	1. Information sheet enclosed, Boring Tools and Their Uses
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test.
4. After successfully completing the Knowledge Test, go on to Enabling Objective No. 3.	

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Boring Tools and Their Uses

In the language of the carpenter, small holes are normally referred to as drilled holes, and large ones as bored holes. For the purpose of this Learning Guide, a boring tool will be defined as the hand brace, any variation of it, and those bits which are commonly used in it.

The hand brace, or bit brace, is used to hold, turn and guide bits, drills, or countersinks. Since drills and countersinks have been covered under the heading of drills, however, only limited reference to them will be made in this Instruction Sheet. Bits, drills, and countersinks which have a square tong, or have flats ground on the shank, are designed to be used in a bit brace. A universal type of chuck, which holds all sizes of square - shank bits, is commonly used.

Bit braces are made with or without a ratchet device. The ratchet type is useful because it functions well in confined spaces where there is not enough room to make a complete sweep (turn) of the handle. The ratchet can be locked or made to operate in either direction (clockwise or counterclockwise).

A brace's size is determined by the sweep of its handle, that is, the diameter made by revolving the handle. Where the leverage is needed, a brace with a small 8-inch sweep is used. Larger-sweep braces are used for turning expansive bits or for boring large holes in hardwood. A 10-inch sweep brace is an average size for general carpentry work.

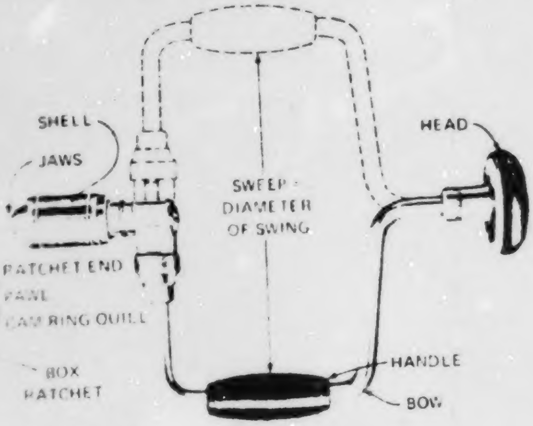

Fig. 1 Parts of a bit brace.

The better quality braces have ball bearing heads and are nickel-plated to resist rust. Oil holes are usually provided at the working parts. Oiling should be done from time to time so the brace works smoothly.

]

Inserting a Bit in a Brace

1. To open the chuck for inserting a bit, grasp the chuck with the left hand. With the right hand, turn the handle to the left to unscrew the chuck body from the shell (A, Figure 2). A few turns will open up the jaws so that the bit tang and shank can be inserted into the socket (B Figure 2).

2. When the bit is in place, grasp the handle with the righthand and the chuck with the left hand. Turn the handle to the right until the bit is held firmly in the jaws.

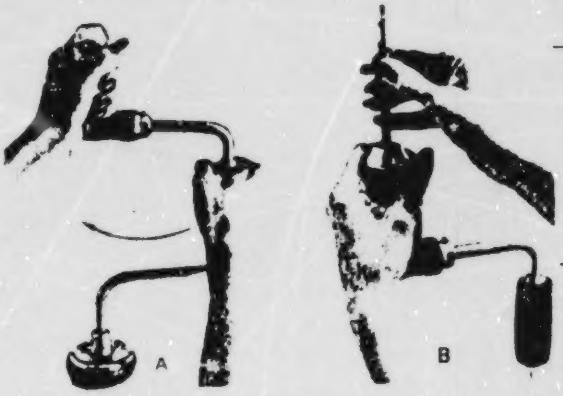

Fig. 2 Inserting bit in the chuck.

Figure 3 shows the working details of a common bit brace chuck. Note that each jaw has a v-shaped groove. Two opposite corners of the taper shank of the bit should be carefully seated in these v grooves, or else the drill revolves off center.

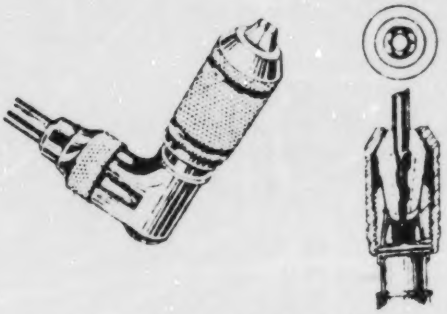

Fig 3 Details of bit brace chuck.

Operating the Ratchet

NOTE: The ratchet is used when boring a hole in a corner or where some object prevents making a full turn with the handle.

1. Turn the cam ring as shown in Figure 4. Turning the cam ring clockwise allows the bit to turn right and gives ratchet action when the handle is turned left.

2. Turn the cam ring counterclockwise to reverse the action.

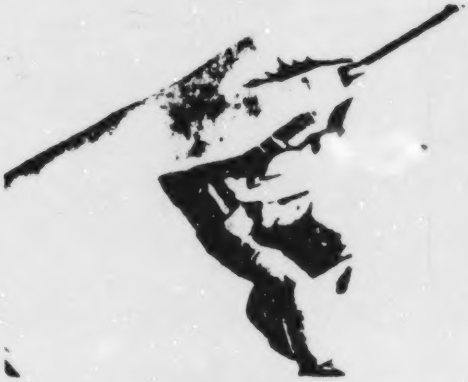

Fig. 4 Setting the ratchet.

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Boring Vertical and Horizontal Holes

1. To bore a vertical hole, proceed as follows:

a. Be sure the stock to be bored is in a fixed position so that it does not move when being bored.

b. Lay out and mark the location of the hole with a scratch awl.

c. Insert a bit of the required size into the bit brace.

d. Place the point of the bit on the center mark. Hold the brace so that the bit is at right angles to the surface to be bored. See A, Figure 5. Test the bit for squareness with a try square from two positions 90 degrees apart. See B, Figure 5.

NOTE: One clue that the bit is square with the surface is if both spurs scribe the surface at the same depth.

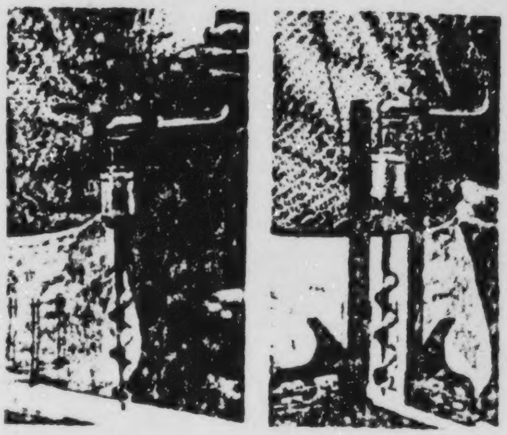

Fig. 5 Boring a vertical hole.

e. Revolve the sweep of the brace slowly clockwise, and at the same time bear down on the knob of the brace so that the bit screw enters the wood. Try to keep the knob in a steady position and keep an even pressure.

NOTE: If the pressure used is not enough, the threads of the feedscrew fill up with broken off wood chips, making boring difficult. To correct this condition, remove the bit from the bore and chip out the bottom of the bore with a chisel, Figure 6.

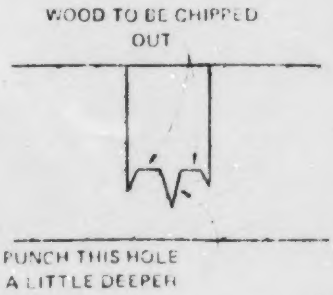

Fig. 6 Chipping out the bottom of the bore.

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With a nail set or nail, make the impression of the feedscrew a little deeper. Also clean out the threads on the feedscrew. Be careful not to damage the threads.

f. Continue boring. If the hole is to be through the entire thickness of the board, stop boring as soon as the feedscrew shows on the opposite side of the board.

NOTE: If the bit enters the wood with difficulty, back it out occasionally to clean the chips from the hole. This reduces friction and heating which can cause the bit to bend.

g. Withdraw the bit from the hole by turning the handle in the opposite direction (counterclockwise).

h. Finish boring the hole from the opposite side of the board, using the feedscrew hole as a center. Use a light pressure and guard against breaking through to the starting side. See A, Figure 8.

NOTE: Another method of boring a hole completely through without splintering is to back up the board with a piece of scrap.

2. To bore a horizontal hole, proceed as follows:

a. Locate, insert, and start the bit as described for vertical boring.

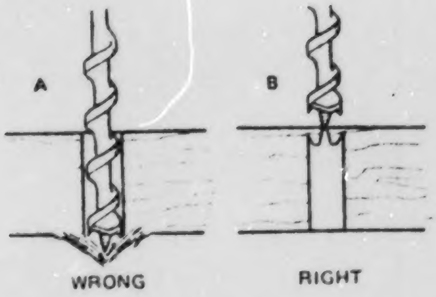

Fig. 7 Wrong and right methods of boring.

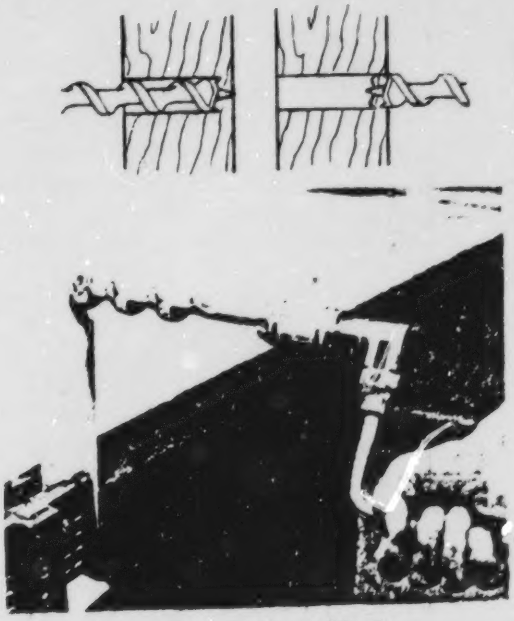

Fig. 8 Horizontal boring.

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b. Sight the drill for squareness on a horizontal and vertical plane as the handle is slowly revolved. Bore slowly to control the bit and maintain it in its correct position.

c. Complete the boring as described for vertical boring.

NOTE: If drilling is to be done near an end such as in Figure 8, the board can split due to the wedging action of the feedscrew. To avoid this, first drill a pilot hole about 3/16 inch in diameter through the board before boring.

Boring a Hole at an Angle

1. When a hole is to be bored at a slight angle, proceed as follows:

a. Lay out the angle on a thin piece of cardboard or plywood. This can be used as a guide in the same manner as the try square. A sliding T bevel set at the correct angle can be used in the same way.

b. Align the bit with the guides. Check the angles from two reference points. The bit should be tilted toward the operator in line with the length of the hole.

c. Bore slowly and continue to bore until the feedscrew shows on the opposite side.

d. Finish boring from the opposite side, keeping the bit in line with the part of the hole already bored.

2. When a hole is to be bored at a sharp angle, proceed as follows:

NOTE: For this type of boring, a wood guide is necessary.

a. Prepare a guide as follows.

1. Bore a vertical hole through a block of wood using the same size auger bit that will be used in making the finished hole. See A, Figure 9.

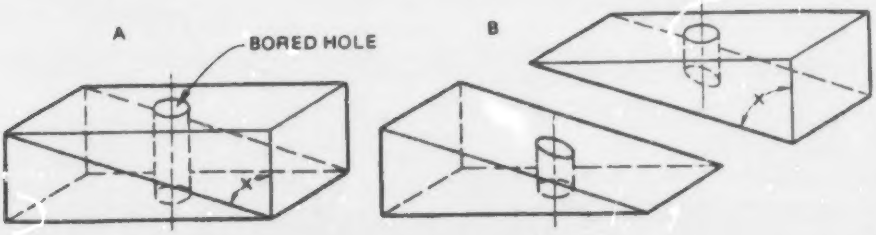


Fig. 9 Guide for boring.

2. Lay out angle X (A, Figure 9), which is the guide angle of the hole, and saw off the bottom of the block.

b. With a compass or dividers, scribe the circumference of the hole to be bored on the surface of the board.

c. Line up the guide hole circumference with the scribed circumference and fasten the block to the board by nailing or clamping. See Figure 10.

d. Insert the bit in the guide hole and start to bore slowly. When boring a through hole, clamp a scrap piece to the back of the board and complete the boring by cutting into the scrap piece.

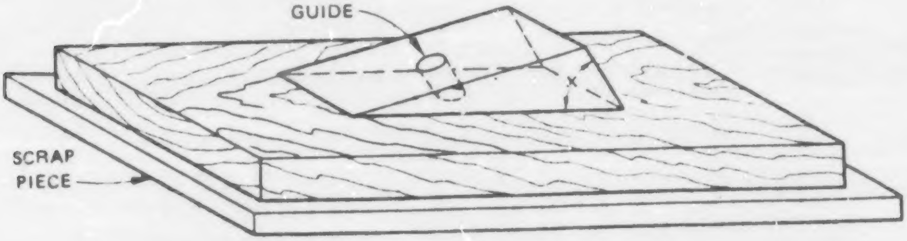


Fig. 10 Guide in position for boring.

Enlarging a Hole with an Auger Bit

1. Plug the hole already bored with a dowel rod flush with both surfaces.

2. Lay out and mark the center of the larger hole to be bored.

3. Place the feedscrew on the center mark and proceed to bore.

NOTE: This method is often used to rebore holes which have been bored off center or out of line.

Boring a Hole to a Depth

NOTE: When drilling or boring a hole to a certain depth, one of several types of bit gauges is used. Bit gauges are made to clamp or fit to an auger bit or countersink. Several types are shown in Figure 11.

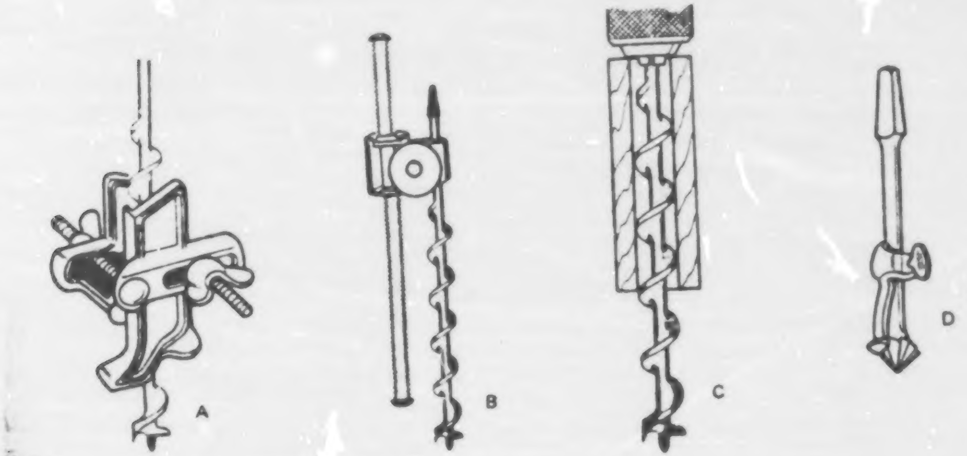


Fig. 11 Types of bit gauges.

A piece of a block of wood bored and cut to a given length is shown at C. This is slipped over the bit, with the length of the bit beyond the block equal to the depth of the hole to be drilled. The block is forced against the chuck of the brace and acts as a stop. At D is shown a depth gauge for the countersink.

1. Select the type of bit gauge to be used. If type A, Figure 12, is used, open it to permit fitting the bit by releasing the wingnuts.

2. Slide the bit gauge down over the screw of the bit from the tang end. This way the gauge does not hit and possibly damage the feedscrew, cutting lips, or the spurs.

3. Set the gauge close to the depth of cut desired and tighten the wing nuts.

4. With a rule, measure the setting from the cutting lip to the bottom of the bit gauge. Make any necessary adjustment by loosening the wing nuts only enough to allow moving the stop to the correct setting.

5. Tighten the bit gauge in place and make a final check of the depth setting.

NOTE: Care should be taken not to draw up the wing nut too tightly. If too much pressure is used, the cast iron gauge can break.

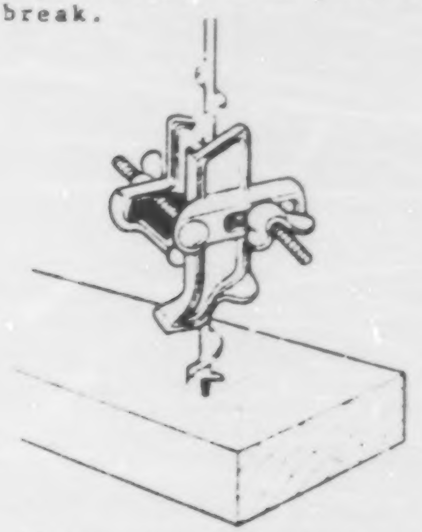


Fig 12 Boring a hole to depth with a bit gauge

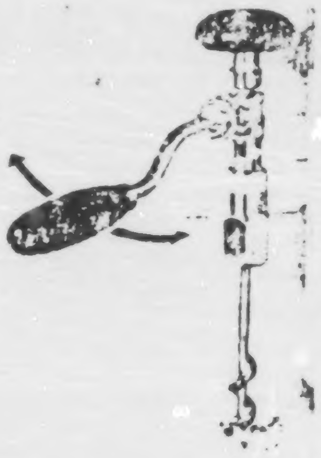


Fig 13 Corner bit brace

6. Refer to Figure 12. Insert the bit with the attached bit gauge in a brace and bore as described for vertical boring.

7. As the bottom of the bit gauge approaches the surface of the board, reduce the boring speed. Continue to bore until the bit stop contacts the surface. After contacting the surface, revolve the bit about one complete turn (using no pressure) to clean out the bottom of the hole.

8. Remove the bit from the hole, using a counterclockwise motion.

9. Use the other types of gauges in a like manner. For type B, Figure 11, the stop is fastened to the shank.

NOTE: For all types of bit stops, when the stop touches the surface being bored, release the pressure and make one full turn with the brace. This keeps the surface from being scratched by the stop. This also cleans out the bottom of the hole.

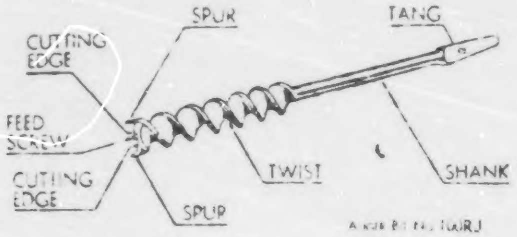
THE CORNER BIT BRACE

There are several types of corner braces. They are used for boring holes located in corners. The type shown in Figure 13 is short so that it can be used under shelving. A ratchet device permits boring without making a full sweep of the handle.

THE AUGER BIT

The auger bit is used in a brace for drilling holes in wood and other soft materials. It cannot be used for drilling metal.

In general, auger bits are made in three lenghts. The dowel (short) bit is about 5 inches long, the medium length about 8 inches long, and the ship (long) bit is between 18 inches and 24 inches long. Other lengths (special purpose bits) are also made. Manufacturers of bits often use their own terms for their bits. Therefore, refer to the manufacturer's catalog when ordering auger bits. The parts of an auger bit are shown in the illustration below.



Short auger bits should be used whenever possible. When a long bit must be used, be sure to hold the bit at a constant angle to the surface being bored. If the angle is changed while boring, the bit will bend. For general work the carpenter uses the medium length bit with a medium thread feedscrew.

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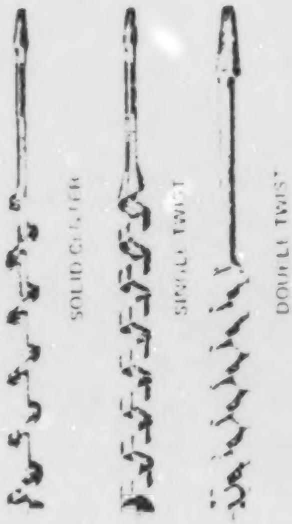
The Twist

There are three styles of auger bits. The difference is in the twist and the center core. The styles are straight-core or solid-center auger bits, single twist (spiral center), and double twist, as shown.



Carpenters prefer the single-twist, solid-center bit. These bits are stronger and clear themselves of chips quickly.

A single-twist bit has less tendency to bind in certain materials than the solid-center bit.

The double-twist bit bores more slowly than the others but cuts more smoothly and accurately. This type of bit is often used to bore holes required for doweled joints.

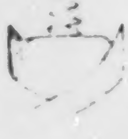
The Screw

Auger bits come with coarse-, medium-, and fine-thread screws. The screw centers and pulls the bit into the material. The cut made on each turn of the bit depends on the pitch of the threads of the screw. In other words, the pitch of the screw determines the feed of the bit.

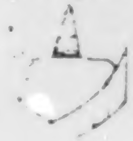
The medium-screw type bit is used for general carpentry work. Fine-screw bits are used where a fine feed is needed to produce a smooth surface. Coarse-screw bits are used where rapid cutting is necessary, such as rough boring by electricians.

The coarse screw has a single thread, and is best for fast cutting in green or gummy wood. These are the fastest feeding bits.

coarse(fast)

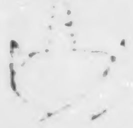


fine (slow)



The medium screw has a double thread and is best for general work with seasoned wood. It is preferred for cabinet and pattern making. These bits are moderately fast feeding.

medium



The fine screw has a double thread, and is best for precision work that requires clean, accurate cutting. This type of bit is also used for boring hard woods.

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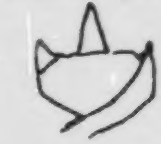
The diamond point bit has no thread at all. It is used only for machine boring where a power-feed is used, since it has no thread to pull it into the wood.

diamond point



The Spurs

The spurs, as shown in Figure 1, touch the wood immediately after the screw. The spurs score the outer edge of the chip ahead of the cutter. A short spur does not cut the edge of the chip completely and makes boring difficult. An ideal spur is one whose length is suited to the feed of the bit, with enough metal back of the cutting edge for strength. If this area is too thick the spur will act as a wedge and drag in the wood.

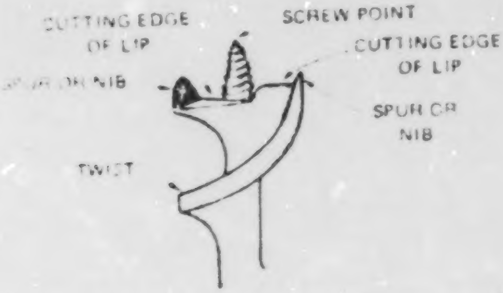


Fig. 1 Parts of the head

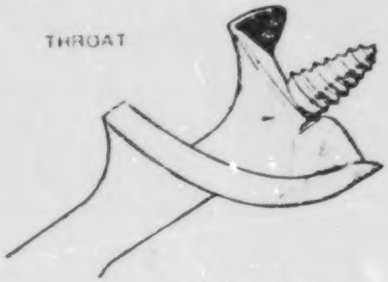


Fig. 2 Location of the throat

The Cutting Lips

The cutting lips follow the spurs and cut the chips starting them up the throat to the twist. It is important that the edges of the two opposite cutters be on the same level and that they are beveled to the proper angle for clearance. If the lips are not in line, one lip does more than half the work. As chips leave the cutter, they flow through the throat of the bit.

The Throat (Clearance) (See Figure 2)

When choosing a bit, pick one with enough room in the throat for the chips to leave the cutting lips. The twist receives the chips from the throat and conveys them to the mouth of the hole. Ample room in the twist keeps the chips moving freely. The outside diameter of the twist of a bit should be slightly less then the diameter of the head. This difference allows the twist to follow the head into the hole without friction.

The Shank

The shank, Figure 3, is the part of the bit that fits into the chuck of the brace. Its ends has four tapered sides (square-shaped tang). All four sides must have exactly the same bevel, or the bit tends to swing off center.

Some auger bits are made so that they can be used in an electric hand drill or in a brace. These bits come with a square, tapered shank, and six equally spaced flats are ground on the shank just below the tang. When used with a power drill, the square, tapered portion must be sawed off to fit the drill chuck. Since there are three jaws in the chuck of the power drill, they clamp on every other flat ground on the shank. The bit can still be used in a hand brace by clamping any two opposite corners of the flats in the grooves of the chuck.

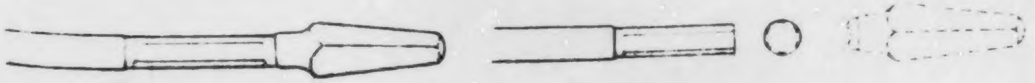


Fig. 3 Auger bit with an adapter shank

On the square, tapered portion of the shank the size (a number) of the bit is stamped. See Figure 4. This number represents the size of the drill in sixteenths of an inch. For example, a bit with the number 87 stamped on the tang indicates a size of 7/16 inch, and a number 8 indicates a 1/2-inch drill (8/16 inch = 1/2 inch). Sizes range from 4 (1/4 inch), to 16 (1 inch), in increments of 1/16 inch.

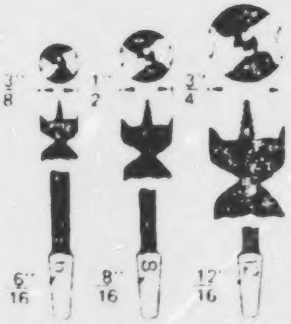


Fig. 4 Identifying the size of a bit

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For holes under 1/4 inch and over 1 inch, other types of drills are used. Holes less than 1/4 inch in diameter are made with a straight-shank twist drill or double-fluted drill. Sizes larger than 1 inch in diameter are bored with an expansive or Forstner bit. In all cases, the size of the drill or bit is stamped on the shank. However, different methods are used to indicate the size. An explanation of this is given as each drill is described in detail later in this unit.

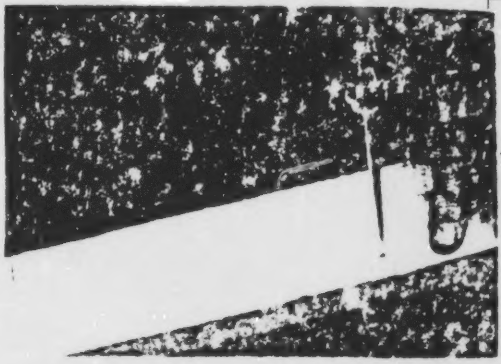

Fig. 5 . Marking with a scratch awl.

Starting an Auger Bit

1. Locate the position of the hole with two intersecting lines (Figure 5).

2. With a scratch awl, make an impression in the board deep enough so that the point of the feedscrew easily seats itself and will not wander as the brace is turned.

CARING FOR AUGER BITS

Things to consider in the care of a bit are preventing it from rusting, storing it properly, and keeping it sharp. Moisture from the hand, or sap from green timber can cause rust spots. This can be prevented by wiping off the bit with an oily rag after each use if the bit gets wet.

Bits should be stored in special containers rather than mixed in with other tools. Wood chests or plastic bags with seats or pockets for each bit are made for this purpose. Cutting edges can also be protected by fastening a cork or block of wood on the feedscrew.

When the spurs and cutters on a bit become dull, they are sharpened by filing. In general, bits are filed more than is necessary. It is not possible to file away much metal from the head of the bit without reducing its boring quality. Look at the bit carefully before filing it. The screw should not be touched with a file.

Resharpening a Spur on an Auger Bit

1. Select an auger bit file, Figure 6.

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2. Rest the bit on a board with the screw pointing up. File the inside of the spurs with the flat side of the file, using only forward strokes to produce the filing action. See Figure 7.

Fig 6 Auger bit file.

3. Continue to file until the leading edge of the spur has a knifelike edge. NOTE: Filing must be done so that there is enough clearance toward the back of the spur. Therefore, filing should be done across the complete inside face of the spur rather than just on the leading edge.

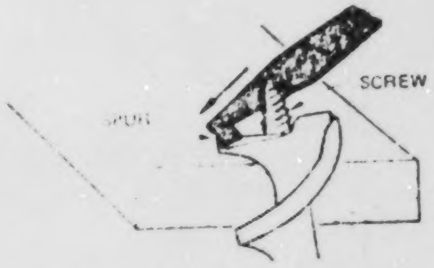


Fig 7 Sharpening the spur.

4. Do not file the outside of the spur unless the bit is damaged so much that it enlarges the outside diameter of the bit. If this is the case, carefully lay the flat side of the file flat against the outside of the spur. Rotate the file around the spur surface until the curled metal is brought in line with the outside of the lip. Then, file the inside edge of the spur to a sharp edge.

NOTE: Unnecessary filing of the spur on the outside removes some of the clearance of the bit which causes binding when cutting. Another method for bringing a bent spur in line is to place the inside of the spur on the edge of an anvil and then to tap the bent portion with a hammer.

Sharpening the Cutters on an Auger Bit

1. Choose an auger bit file. A good second cut, half-round or three-cornered file can also be used, providing its size fits the surfaces to be filed.

2. Rest the bit on a board with the screw down. Tilt the bit so that the cutter can be sharpened. See Figure 8.

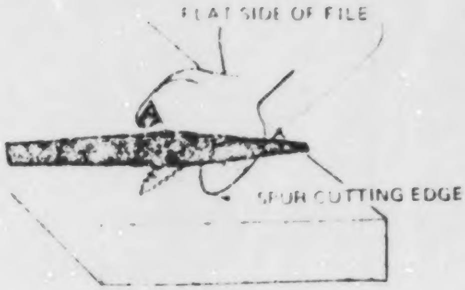


Fig 8 Sharpening a cutting lip.

3. Apply the fat, serrated side of the file to the underside of the lips, the side toward the screw. Use forward strokes to produce the filing action. File far back into the throat. Do not leave the edge too blunt; the desirable result is a gradual taper from a keen edge.

4. Reposition the bit, and file the opposite cutting edge in a like manner. Both edges should be filed to the same level to produce chips of equal thickness.

Restraightening an Auger Bit

1. Roll the bit on a level wood surface until the bend is located.

2. Tap it on the high side with light blows of a hammer.

3. Check it for final trueness by rolling it on a flat metal surface.

EXPANSIVE BIT

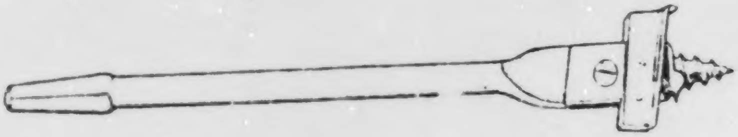


Fig. 9 Expansive bit

The expansive bit, Figure 9, is used to bore holes larger than 1 inch in diameter. Several adjustable cutter blades of different sizes are supplied with this bit. The bit can be adjusted to a range of sizes up to 4 inches. Each cutter can be adjusted for a range of sizes within its own limits of span by an integral screw type device on the head of the bit.

The expansive bit is made in several styles. One style uses a micro-dial in the head of the bit for making size adjustments. Another style uses a simple screw arrangement. For the screw arrangement, one complete turn of the cutter adjusting screw enlarges or reduces the hole 1/8 inch; one half turn, 1/16 inch.

After the cutter is set, it is locked in place with a setscrew. Size adjustments are checked by measuring from the tip of the feedscrew to the outside edge of the spur, and by making trial cuts in scrap wood. These should be made only after the cutter is locked in place.

When using this bit, bore until the lead screw appears on one side. Then turn the work over and finish boring from the opposite side. The spur and cutting lip on the cutter are sharpened while held in the head of the bit in the same way as described for sharpening an auger bit. The bit and cutter should be kept in a protective case so that the cutting edges are not damaged.

SELF-CHECK FOR ENABLING OBJECTIVE

2
number

PAGE 34 OF 39

DUTY

TASK

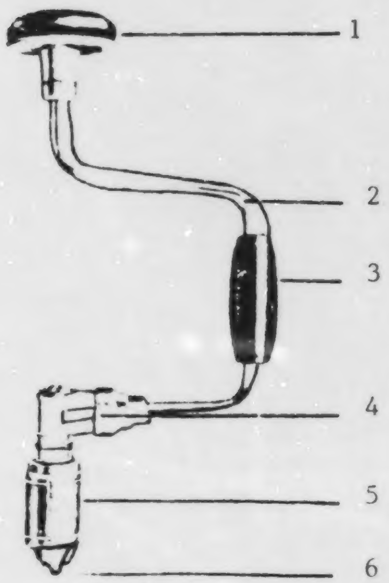
EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.



a. ratchet assembly or box ratchet

b. shell

c. head

d. jaws

e. handle

f. bow

g. twist

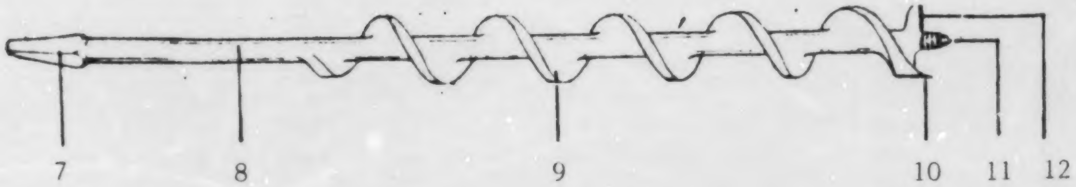
h. shank

i. spur

j. spur

k. tang

l. cutting edge



SELF-CHECK FOR ENABLING OBJECTIVE 2 number ANSWER KEY

PAGE 35 OF 39

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

1. c
2. f
3. e
4. a
5. b
6. d
7. k
8. h
9. g
10. j
11. i
12. l

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3 number PAGE 36 OF 39

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Use drilling and boring tools.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for your job assignment of drilling and boring.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment.	2. Job Plan Sheet.
3. Have instructor check your Job Plan Sheet.	3. Instructor
4. Practice drilling and boring.	4. a. Prepared Job Plan Shseet b. Tools c. Materials
5. Complete the Self-Check.	5. Self-Check enclosed.
6. Have instructor inspect your work.	6. Instructor
7. When you think you can perform this task take the Performance Test.	7. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 3

number

PAGE 37 OF 39

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by completing the items below using a separate sheet of paper.

	YES	NO
1. Was the proper tool selected for each drilling job?..................................	____	____
2. Was the proper tool selected for each boring job?..................................	____	____
3. Was the brace held properly?..................	____	____
4. Was the automatic drill used correctly?........	____	____
5. Was the hand drill used correctly?.............	____	____
6. Was the expansive bit adjusted to proper tolerances?................................	____	____
7. Was the bit filed in the proper manner?.......	____	____
8. Was the desired bit size selected according to its number?................................	____	____

ERFORMANCE TEST FOR C | 0 7
duty task number

PAGE 38 OF 39

IRECTIONS:

Given access to a work station, drilling and boring tools, and materials, you will drill and bore lumber. Your performance wil be evaluated based on the items listed below.

ERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Was the proper tool selected for each drilling job?		
2. Was the proper tool selected for each boring job?..		
3. Was the brace held properly?..............................		
4. Was the automatic drill used correctly?..............		
5. Was the hand drill used correctly?.....................		
6. Was the expansive bit adjusted to proper tolerances?..............................		
7. Was the bit filed in the proper manner?................		
8. Was the desired bit size selected according to its number?..		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

Instructional Resources

Texts

McDonnell, L.P., Kaumeheiwa. A., The Use of Hand Woodworking Tools, Delmar Publishers Inc.,1962.

KNOWLEDGE TEST FOR C | 0 7

duty | task number

PAGE 1 OF 3

DUTY

TASK

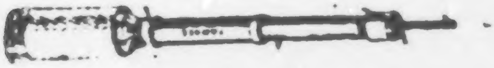
DEPT.

PROG.

TASK: Use Drilling and Boring Tools

DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.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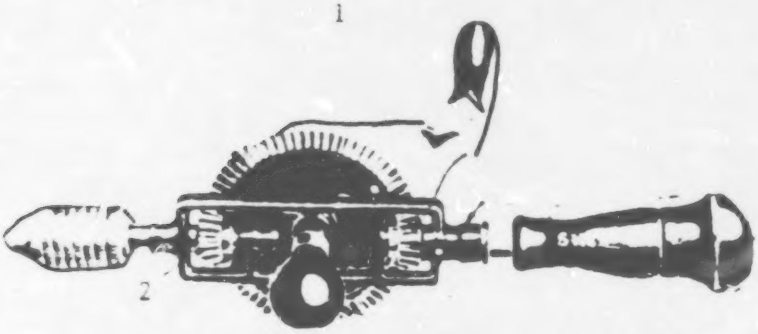
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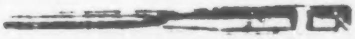
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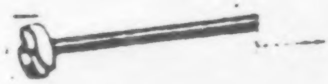
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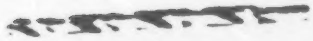
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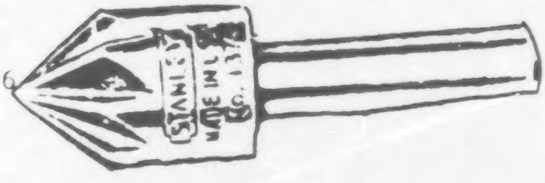
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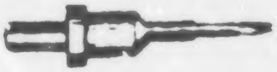
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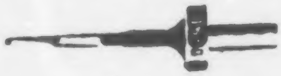
8

a. hand drill

b. combination wood drill and countersink

c. combination wood drill countersink and counterbore

d. automatic drill point

e. Forsner bit

f. automatic drill

g. twist drill

h. countersink

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KNOWLEDGE TEST FOR C | 0 | 7

CONTINUED duty | task number

PAGE 2 OF 3

DUTY

TASK

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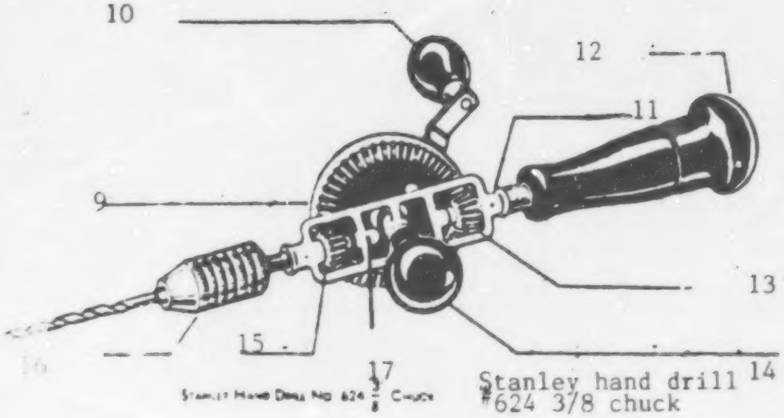
PROG.


10
12
11
9
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15
16
17
14
Stanley Hand Drill No 624 3/8 Chuck

Stanley hand drill
#624 3/8 chuck

i. speed gear

j. idler pinion

k. frame

l. oil port

m. chuck

n. crank and handle

o. handle

p. pinion

q. side handle

r. chuck

s. spiral spindle

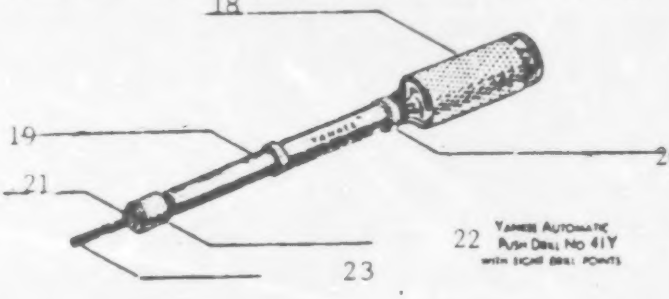
t. drill point

v. chuck sleeve

v. magazine locking ring

w. magazine handle

Yankee automatic push drill N° 41 Y with eight drill points


18
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Yankee Automatic Push Drill No 41Y with eight drill points

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KNOWLEDGE TEST FOR C 0 7

CONTINUED duty task number

PAGE 3 OF 3

DUTY
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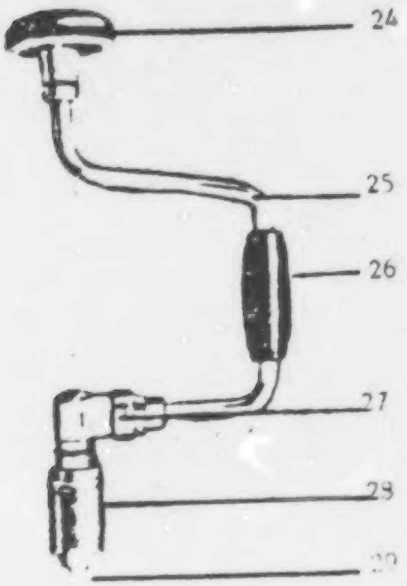
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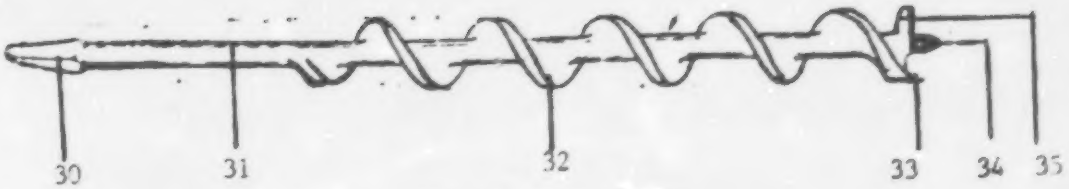
29

a. ratchet assembly or box ratchet
b. shell
c. head
d. jaws
e. handle
f. bow
g. twist
h. shank
i. feed screw
j. spur
k. tang
l. cutting edge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35

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C-07 Use Drilling and Boring Tools
Answer Key

1. f
2. a
3. d
4. e
5. g
6. h
7. c
8. b
9. a
10. f
11. c
12. g
13. b
14. i
15. h
16. e
17. d
18. o
19. k
20. n
21. j
22. m
23. l
24. c
25. f
26. e
27. a
28. b
29. d
30. k
31. h
32. g
33. j
34. i
35. l

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 0 3 Identify Employment Opportunities

DRAFT

PURPOSE:

Carpentry is one of the oldest occupations known, dating back to man's leaving the caves and beginning to build shelters. Many different phases of carpentry make it one of the most versatile fields of skilled labor, in terms of employment opportunities. Employment is available for those preferring inside or outside settings, self or company employment, hourly or production pay scales, field or factory conditions, and many others. The purpose of this learning guide is to expose you to these opportunities.

PLEASE DO NOT WRITE IN LEARNING GUIDE

DUTY
TASK
PREREQ.
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PROG.
REVISED

THE SCHOOL BOARD OF PALM BEACH COUNTY

DEPARTMENT OF VOCATIONAL-TECHNICAL EDUCATION

North Technical Education Center
7071 Garden Road
Riviera Beach, Florida 33404

South Technical Education Center
1300 S. W. 30th Avenue
Boynton Beach, Florida 33435

West Technical Education Center
2625 State Road 715
Belle Glade, Florida 33430

E. Miles Bacon, Director of Vocational-Technical Education

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THIS STUDENT LEARNING GUIDE WAS DEVELOPED BY:

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Mike Haag, Carpentry Instructor
South Technical Education Center

James R. Kidd, Carpentry Instructor
West Technical Education Center

The format used in this student learning guide is one of the products developed through a grant from the Division of Vocational Education, Florida Department of Education which designated Ridge Vocational-Technical Center as a state demonstration site for competency-based vocational education.

OBJECTIVES PAGE 3 OF 24

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(include condition, performance,
and standard)

GIVEN: access to reference material,

YOU WILL: identify employment opportunities

HOW WELL: You must successfully complete the Knowledge Test.

Your performance will be assessed by your instructor using the Performance Test on page 26.

ENABLING OBJECTIVES:

1. Acquire knowledge of carpentry as a trade.
2. Identify the characteristics of the different fields of the trade.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 4 OF 24

Enabling objective:

Acquire knowledge of carpentry as a trade.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. View Resource No. 1 to learn about carpentry as a trade.	1. Dorsett Education Systems Strip/Tape Series: KC7 "The Trade of Carpentry"
2. Read Resource No. 2 to determine characteristics of the trade.	2. Instruction Sheet enclosed, The Job
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

DUTY

TASK

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DEPT.

PROG.

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 1 number PAGE 5 OF 24

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

The Job

A carpenter constructs, installs, and repairs buildings and fixtures of wood, plywood, and wallboard using carpenter's hand and power tools.

Job Duties:

1. Erects framework in buildings, including subflooring, sheathing, partitions, floor joints, studding, and rafters.
2. Installs molding, wood paneling, cabinets, window sashes, door frames doors and hardware.
3. Builds stairs and lays floors.
4. Lays out work from blueprints and building plans.
5. Uses ruler, framing square, and calipers to measure lumber.
6. Saws lumber to size with hand or power saws and fits it into place, using nails, dowel pins or glue.
7. Selects specific types of lumber and other materials.
8. Shapes materials to prescribed measurements.
9. Applies shock-absorbing, sound-deadening, decorative paneling to ceiling and walls.
10. Constructs heavy forms and pours chutes for cement masons.
11. Erects scaffolding and ladders.
12. May do specialty carpentry work such as parquetry floors, finish work, etc.

Working Conditions

Work is outside in hot or cold weather.

Hours of Work:

Some overtime depending on location and degree of construction activity.

Usual Fringe Benefits:

Depending upon employer the following may be available; paid holidays and vacation, health and welfare plans, retirement plans, social security, premiums for hazardous work.

Job Characteristics:

Personal Interests	Scholastic Aptitudes	Physical Traits
You must like to be:	-High School diploma preferred -Shop or Industrial Arts courses helpful	You must be able to:
-Accurate -Precise -Patient -Reliable -Tolerant -Able to work where there is dust and noise		-Lift and carry objects weighing between 50 and 100 pounds -Climb, balance, stoop, kneel -Crawl -Reach -Grasp and hold -Use hands and eyes well

You Should Know That:

- Four years of apprenticeship or a longer period of on-the-job training is required.
- Carpenters may be subject to seasonal fluctuations in employment.
- Union membership may be required.
- Apprentice carpenters are paid about 50% of the Master Carpenter's wages, with 5% increases each 6 months.

Economic Returns:

Earnings Range	$6.00 - $10.80/hour and above
Most workers earn	$5.[illegible]0 - $9.00/hour
Usual starting salary	$4.50 - $5.25/hour or 50% or Journeyman's wage

Please note...Not all employers are required to pay the Federal Minimum Wage. For specific information about employers in your area contact your local office of the U.S. Department of Labor, Wage and Hour Division. Your counselor or Occupational Specialist can help.

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 1 number PAGE 7 OF 24

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Things to Think About:

- Salary is good but bad weather may affect earnings through loss of time.
- There is a certain satisfaction in creating and building homes, offices, etc.
- Carpenters working for contractors receive no fringe benefits such as paid vacations and holidays.
- Most Carpenters work for building contractors for the length of time it takes to complete a particular job; when the job is completed the Carpenter must find a new project on which to work.

Where You Will Work:

You will work for a construction company or contractor, or be self employed as a subcontractor.

Job Outlook:

1. Opportunities are greatest in cities, population explosion areas, in government agencies, and with contractors and home builders.

2. Job opportunities will depend on how much construction takes place in Florida.

Job Advancement:

1. The carpenter with experience and additional training may be promoted to supervisor, construction supervisor, superintendent, estimator or contractor.

Related Occupations:

- Air Conditioning Mechanic
- Bricklayer
- Electrical Repairer
- Instrument Repairer
- Locksmith
- Maintenance Mechanic
- Electronic Assembler
- Millwright
- Plumber
- Radio TV Servicer
- Roofer
- Small Engine Repairman

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For More Information:

-United Brotherhood of Carpenters
and Joiners of America
101 Constitution Avenue, N.W.
Washington, D.C. 20006
-Associated General Contractors
of America, Inc.
1957 E. Street, N.W.
Washington, D. C. 20006

1. A high school diploma is helpful.

2. Some community colleges and vocational-technical schools offer programs in Carpentry.

3. Carpentry experience in military service may serve as a part of the apprenticeship.

More Facts:

This listing represents a sample course of study for the program Carpenter. See your Guidance Counselor or Occupational Specialist for the exact course of study at a particular school.

Safety
Building Layouts
Power Hand Tools
Concrete Construction
Machines
Floor Construction
Wall Construction
Roof Construction
Structural Steel Construction
Building Codes
Employer-Employee Relations
Cabinets
Exterior Trim
Veneer Walls
Applied Math & Cost Analysis
Drafting & Blueprint Reading
Hand Tools
Tool Sharpening
Termite Control
Maintenance & Sharpening Power Tools
Ceiling Construction
Aluminum Construction
Job Laboratory
Estimating
Job Interview Skills
Interior Trim
Load Bearing Walls
Stair Building

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As an apprentice you will learn:

-To lay out walls, doors and windows	750 Hours
-To care for and use hand tools and machines	1000
-To build concrete forms	850
-To set up rough framing	1500
-To put in doors and windows (outside)	1000
-To cover roofs	200
-To set up inside window and door frames	600
-To build closets and stairs	700
-To put in flooring	400
-To put hardware on woodwork	500
-To build scaffolds, sheds and walkways	500
Total Hours	8000

Area Vocational Technical Centers Offering Training in Carpentry.

Atlantic Vocational- Technical Center 4700 Coconut Creek Parkway	Coconut Creek, FL 33066	305/979-2638
Bay Area Vocational- Technical Center 1976 Lewis Turner Blvd.	Ft. Walton Beach, FL 32458	904/862-0167
Bradford-Union Area Vocational-Technical Center 609 N. Orange Street	Starke, FL 32091	904/964-6150
Collier County Vocational-Technical Center 3702 Estey Avenue	Naples, FL 33942	813/774-6635
Erwin Vocational- Technical Center 2010 East Hillsborough	Tampa, FL 33610	813/238-8631
Thomas P. Haney Vocational-Technical Center 3016 Highway 77	Panama City, FL 32405	904/769-2191
Lake County Area Vocational-Technical Center 2001 Kurt Street	Eustis, FL 32736	904/357-8222
Lewis M. Lively Area Vocational- Technical Center 500 N. Appleyard Drive	Tallahassee, FL 32204	904/576-3181
Radford M. Locklin Vocational-Technical Center 2216 Berryhill Road	Milton, FL 32570	904/626-1918
Manatee Area Vocational-Technical Center 5603 34th Street, West	Bradenton, FL 33507	813/755-2641

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North Technical Education Center 071 Garden Road	Riviera Beach, FL 33404	305/848-0692
Pinellas Vocational- Technical Institute 100 154th Avenue, North	Clearwater, FL 33520	813/531-3531
Polk County Area Vocational-Technical Center P.O. Box 720	Eaton Park, FL 33840	813/665-1220
Ridge Vocational- Technical Center 00 State Road 544	Winter Haven, FL 33880	813/422-6402
St. Augustine Technical Center Collins Avenue at Del Monte Drive	St. Augustine, FL 32084	904/824-4401
St. Petersburgh Voca- tional-Technical Institute 1 34th Street, South	St. Petersburgh, FL 33711	813/327-3671
South Technical Education Center 00 S.W. 30th Avenue	Boynton Beach, FL 33435	305/278-0364
George Stone Area Vocational-Technical Center Route 10, Box 530	Pensacola, FL 32406	904/944-1424
Suwannee-Hamilton Area Vocational- Technical Center 15 S.W. Pinewood Drive	Live Oak, FL 32060	904/362-2252
Taylor County Area Vocational-Technical Center 33 Highway 19, South	Perry, FL 32347	904/584-7603
Washington-Holmes Area Vocational Technical Center 09 Hoyt Street	Chipley, FL 32428	904/638-1180

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West Technical Education Center 2625 State Road 715	Belle Glade, FL 33430	305/996-4930
Withlacoochee Area Vocational-Technical Center 1607 W. Main Street	Inverness, FL 32650	904/726-2430

Community Colleges

Central Florida Community College P.O. Box 1388	Ocala, FL 32678	904/237-2111
Daytona Beach Community College P.O. Box 1111	Daytona Beach, FL 32015	904/255-8131
Florida Jr. College at Jacksonville 21 West Church Street	Jacksonville, FL 32202	904/368-1812 904/358-1812
Pasco-Hernando Community College 2401 S. Highway 41 North	Dade City, FL 33525	904/576-6701
Sante Fe Community College P.O. Box 1530	Gainesville, FL 32602	904/377-5161
Seminole Community College	Sanford, FL 32771	305/323-1450
South Florida Junior College 600 W. College Drive	Avon Park, FL 33825	813/453-6661

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SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 12 OF 24

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DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. A carpenter lays out work from blueprints and building plans.
2. A carpenter should be accurate and patient.
3. Apprentice carpenters earn roughly 50% of a master carpenter's wages.
4. Bad weather may effect weekly earnings.
5. A high school diploma is helpful for entrance into the trade.
6. Union membership may be a requirement on some jobs.
7. A carpenter may repair buildings or fixtures of wood.
8. Usually, carpenters receive no fringe benefits from an employing contractor.

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Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE
ANSWER KEY

1
number

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1. True
2. True
3. True
4. True
5. True
6. True
7. True
8. True

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All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

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Enabling objective

Identify the characteristics of the different fields of the trade.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify different fields within the trade of carpentry.	1. Text: Dictionary of Occupational Titles, Fourth Edition, 1977, pages 854-857. or Instruction Sheet enclosed, Carpenters and Related Occupations
2. Use Resource No. 2 to identify the characteristics of each field.	2. Text: Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles U.S. Employment Service 1981. or Instruction Sheet enclosed, Job Characteristics
3. Practice determining job characteristics.	3. Instruction Sheet enclosed, Practice Identification Sheet
4. Evaluate your knowledge using the Self-Check.	4. Self-Check enclosed.
5. Go on to Enabling Objective No. 3.	

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 2 number PAGE 15 OF 24

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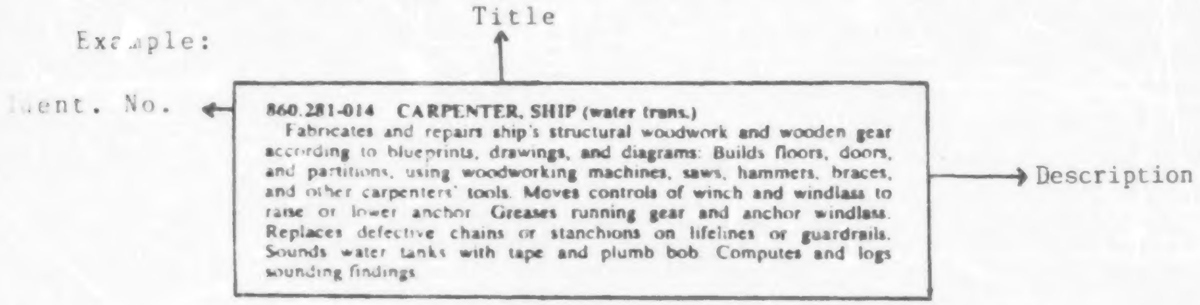
Carpenters and Related Occupations

1. Read the introduction labeled 860 carpenters and related occupations.

2. Each sub-heading under this main heading is composed of three major parts. They are: Employment Service Job Identification Number, Title, and Description.

Example:



860.281-014 CARPENTER, SHIP (water trans.)
Fabricates and repairs ship's structural woodwork and wooden gear according to blueprints, drawings, and diagrams: Builds floors, doors, and partitions, using woodworking machines, saws, hammers, braces, and other carpenters' tools. Moves controls of winch and windlass to raise or lower anchor. Greases running gear and anchor windlass. Replaces defective chains or stanchions on lifelines or guardrails. Sounds water tanks with tape and plumb bob. Computes and logs sounding findings.

3. Read all the information contained in this listing, for exposure to each field.

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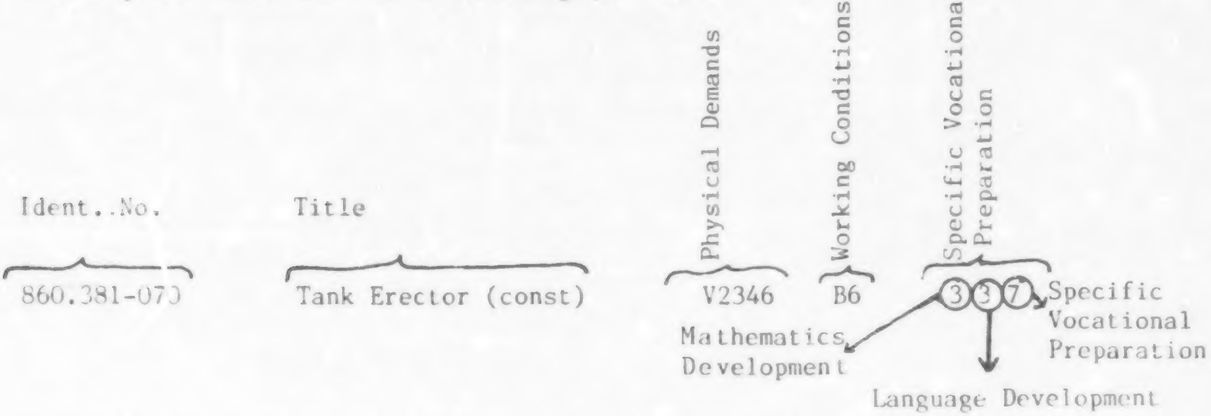
Job Characteristics

1. This instruction sheet consists of two sheets, one of them is a key to enable you to understand the information contained in code on the other sheet. This sheet is labeled "Key".

2. The key is used in the following manner.


Ident..No.
Title
Physical Demands
Working Conditions
Specific Vocational Preparation
860.381-070
Tank Erector (const)
V2346
B6
3
3
7
Specific Vocational Preparation
Mathematics Development
Language Development

a. The identification number is assigned by the United States Employment Service and is used for cataloging purposes. -860.331-070.

b. The title is the name of the employment field. - Tank Erector (const.)

c. The physical demands column tells the strength requirements and physical requirements of each job. From the key sheet.

V= Very heavy lifting
2= Climb and balance
3= Stoop, kneel, crouch, crawl
4= Reach, handle, finger, feel
6= See (acuity, depth, perception, etc.)

d. The working conditions column tells whether the job is inside or outside, and other pertinent information, as shown under working conditions in the key = B-6.

B= Both inside and out.
6= Hazardous work.

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e. The specific vocational preparation column tells what requirements are needed for a Journeyman's rating in this trade. A Journeyman is one who thoroughly knows a trade. = 3 3 7.

3 = 30 days to 3 months mathematics development
3 = 30 days to 3 months language development
7 = 2-4 years experience

3. The purpose of this information is to help select an occupation suited to an individual's personal abilities and qualifications. For instance, someone with back problems would not be well suited for a tank erector, because physical demands shows "V" or heavy lifting, we should use this information in choosing an occupation.

Identification Key

This key is provided to aid users in identifying the numerals and letters in the physical demands, environmental conditions, and training time columns in the text. It may be removed and kept handy for ready reference.

Physical Demands

1-Strength (Lift, Carry, Push, Pull):

	Maximum Lift	Frequent Lift/Carry
S Sedentary	10 lbs.	
L Light	20 lbs.	Up to 10 lbs.
M Medium	50 lbs.	Up to 25 lbs.
H Heavy	100 lbs.	Up to 50 lbs.
V Very Heavy	Over 100 lbs.	Over 50 lbs.

2-Climb and Balance
3-Stoop, Kneel, Crouch, Crawl
4-Reach, Handle, Finger, Feel
5-Talk, Hear
6-See (Acuity, Depth, Perception, Field of Vision, Accommodation)

Working Conditions

1-I Inside (75 percent or more)
O Outside (75 percent or more)
B Both

2-Extremes of Cold plus temperature changes
3-Extremes of Heat plus temperature changes
4-Wet and Humid
5-Noise and Vibration
6-Hazards
7-Fumes, Odors, Toxic Conditions, Dust, Poor Ventilation

Specific Vocational Preparation

9 Over 10 years
8 4 to 10 years
7 2 to 4 years
6 1 to 2 years
5 6 months to 1 year
4 3 to 6 months
3 30 days to 3 months
2 Short Demonstration - 30 days
1 Short Demonstration only

INSTRUCTION SHEET FOR ENABLING OBJECTIVE 2 number PAGE 19 OF 24

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Occupational Exploration Chart

860.131-014	SUPERVISOR, BOATBUILDERS, WOOD (ship & boat bldg. & rep.)	L 2 3 4 5 6	B 5	4	3	8
850.131-022	SUPERVISOR, JOINERS (ship & boat bldg. & rep.)	L 3 4 5 6	I 5	4	3	8
807.361-014	BOAT REPAIRER (ship & boat bldg. & rep.)	M 2 3 4 5 6	I 6	3	3	7
860.131-018	SUPERVISOR, CARPENTERS (const.)	M 2 3 4 5 6	B 5 6	4	3	8
860.281-010	CARPENTER, MAINTENANCE (any ind.)	M 2 3 4 6	I 4 5 6	3	3	7
860.281-014	CARPENTER, SHIP (water trans.)	M 2 3 4 6	B 5 6	3	3	7
860.381-010	ACOUSTICAL CARPENTER (const.)	M 2 3 4 6	I	3	2	7
860.381-014	BOATBUILDER APPRENTICE, WOOD (ship & boat bldg. & rep.)	M 2 3 4 6	B 5	4	4	7
860.381-018	BOATBUILDER, WOOD (ship & boat bldg. & rep.)	M 2 3 4 6	B 5	4	4	7
860.381-022	CARPENTER (const.)	M 2 3 4 6	B 5 6	3	3	7
860.381-026	CARPENTER APPRENTICE (const.)	M 2 3 4 6	B 5 6	3	3	7
860.381-034	CARPENTER, MOLD (brick & tile; conc. prod.)	M 3 4 6	B	3	3	7
860.381-038	CARPENTER, RAILCAR (loco. & car bldg. & rep.)	M 2 3 4 6	B 5 6	3	3	7
860.381-050	JOINER (ship & boat bldg. & rep.)	M 2 3 4 6	I 5 6	3	3	7
860.381-054	JOINER APPRENTICE (ship & boat bldg. & rep.)	M 2 3 4 6	I 5 6	3	3	7
860.381-058	SHIPWRIGHT (ship & boat bldg. & rep.)	M 2 3 4 6	O 5 6	4	3	8
860.381-062	SHIPWRIGHT APPRENTICE (ship & boat bldg. & rep.)	M 2 3 4 6	O 5 6	4	3	8
860.381-066	TANK BUILDER AND ERECTOR (const.)	M 3 4 6	B 6	3	3	7
869.281-014	HOUSE BUILDER (const.)	M 2 3 4 6	B 6	3	3	7
860.381-030	CARPENTER, BRIDGE (r.r. trans.)	H 2 3 4 5 6	O	2	2	7
860.381-042	CARPENTER, ROUGH (const.)	H 2 3 4 6	B 6	4	2	7
860.381-046	FORM BUILDER (const.)	H 2 3 4 6	O	3	2	7
859.381-034	TIMBER FRAMER (mining & quarrying)	H 2 3 4 6	I 6	2	2	6
860.381-070	TANK ERECTOR (const.)	V 2 3 4 6	B 6	3	3	7

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Instruction Sheet prepared by James R. Kidd

860 CARPENTERS AND RELATED OCCUPATIONS

This group includes occupations concerned with fabricating, installing, and repairing structures and structural members made of wood and materials that can be worked like wood, such as plastic and fiberglass, using handsaws, ripsaws, planers, braces, hammers, and other carpentry tools and woodworking machines.

860.131-010 SUPERVISOR, ACOUSTICAL TILE CARPENTERS (const.)

Supervises and coordinates activities of workers engaged in installing acoustical tile to walls and ceilings of buildings. Measures and marks centerlines, guidelines, and location of hooks that hold ceiling suspension grid, according to blueprints and written specifications, to lay out work, using level, plumbline, chalkline, and tape measure. Directs workers in various installation tasks, such as suspending metal grids from ceilings, alining and butting tile with joints of previously laid tile, and securing tiles with nails, screws, staples, or glue. Inspects smoothness of surfaces, alinement and butting of tiles, and fastening of tile for adherence to specifications. Performs other duties as described under SUPERVISOR (any ind.)

860.131-014 SUPERVISOR, BOATBUILDERS, WOOD (ship & boat bldg. & rep.) carpenter supervisor, wooden ship.

Supervises and coordinates activities of workers engaged in building, repairing, or modifying wooden boats, liferafts, floats, or pontoons. Assigns workers to specific duties, such as building pilot houses, cockpits, or cabins, installing masts or booms, laying keels and installing ribs, and fabricating and installing rudders and rudder controls. Directs workers in such procedures as installing skylights, desks, chairs, cabins, and other structural units and furnishings. Inspects specific assemblies such as door panels, ceiling panels, and wall coverings for conformance to dimensional specifications and quality standards, using level, square, and measuring instruments and applying knowledge of carpentry. Trains new workers in use of equipment and tools. Performs other duties as described under SUPERVISOR (any ind.)

860.131-018 SUPERVISOR, CARPENTERS (const.)

Supervises and coordinates activities of workers engaged in construction, installation, and repair of wooden structures and fixtures. Examines blueprints to determine dimensions of structure. Lays out floor plan and cabinetwork, using rule, framing square, and calipers. Selects materials and structural units, such as lumber, prefabricated doors and cabinets of wood or plastic, and paneling, and inspects them to insure conformance with provisions of building code and local ordinance. Determines sequence of activities concerned with fabrication, assembly, and erection of structure. Assigns workers to such tasks as cutting material to size, building concrete forms, erecting wooden framework, and laying flooring. Inspects work performed by subcontractors, including ductwork, wiring, and pipe installations, to insure conformance with specifications. Installs doors, builds stairs, and lays hardwood floors. May supervise workers engaged in building timber structures, such as cofferdams, trestles, and supports for concrete forms. May make cost estimates for contracts. Performs other duties as described under SUPERVISOR (any ind.). May be designated according to area of specialization as BOWLING-ALLEY-INSTALLATION SUPERVISOR (const.); COFFERDAM-CONSTRUCTION SUPERVISOR (const.); FORM-BUILDING SUPERVISOR (const.); TIMBERING SUPERVISOR (const.).

860.131-022 SUPERVISOR, JOINERS (ship & boat bldg. & rep.)

Supervises and coordinates activities of workers engaged in fabricating, installing, and repairing wooden furnishings in ships or boats. Assigns specific tasks to workers, such as installing interior wood paneling in cabins, laying tile or linoleum on decks, installing soundproofing materials to equipment spaces, and installing laminated plastic or fiberboard surfaces on tables or workbenches. Confers with supervisory personnel of other crafts to coordinate worker assignments and to achieve maximum production. Performs other duties as described under SUPERVISOR (any ind.)

860.131-026 SUPERVISOR, MOLD CONSTRUCTION (conc. prod.)

Supervises and coordinates activities of workers engaged in fabrication and repair of wooden forms and molds used for casting concrete products: Requisitions materials, tools, and parts for machinery required to fabricate or repair wooden molds and forms. Inspects products at various stages of construction to insure conformance with standards. Measures, cuts, shapes, and assembles materials to repair or construct molds and forms according to blueprint specifications, using ruler, handtools, and power tools. Performs other duties as described under SUPERVISOR (any ind.).

860.261-010 CARPENTER INSPECTOR (any ind.)

Inspects buildings, desks, cabinets, tables, and other wooden structures and equipment in establishments to insure specified standards of maintenance. Reports nature and extent of repairs needed or directs CARPENTERS, MAINTENANCE (any ind.) to make repairs. Keeps records of conditions before and after repairs. May make repairs within limits of preventive maintenance.

860.281-010 CARPENTER, MAINTENANCE (any ind.) carpenter, repair; carpentry repairer.

Constructs and repairs structural woodwork and equipment in an establishment, working from blueprints, drawings, or oral instructions. Builds, repairs, and installs counters, cabinets, benches, partitions, floors, doors, building framework, and trim, using carpenter's handtools and power tools. Installs glass in windows, doors, and partitions. Replaces damaged ceiling tile, floor tile, and sheet plastic wall coverings. May build cabinets and other wooden equipment in carpenter shop, using woodworking machines, such as powersaws, shaper, and jointer [CABINETMAKER (woodworking)]. May install window shades, venetian blinds, curtain rods, and wall fans for tenants. May be designated according to place at which work is performed as CARPENTER, MINE (mining & quarrying); or according to specific items made or maintained as FLUME MAKER (mining & quarrying), FRAME MAKER (leather mfg.), MEAT-CUTTING-BLOCK REPAIRER (any ind.).

860.281-014 CARPENTER, SHIP (water trans.)

Fabricates and repairs ship's structural woodwork and wooden gear according to blueprints, drawings, and diagrams: Builds floors, doors, and partitions, using woodworking machines, saws, hammers, braces, and other carpenters' tools. Moves controls of winch and windlass to raise or lower anchor. Greases running gear and anchor windlass. Replaces defective chains or stanchions on lifelines or guardrails. Sounds water tanks with tape and plumb bob. Computes and logs sounding findings.

860.381-010 ACOUSTICAL CARPENTER (const.) acoustical-material worker; metal-tile lather.

Mounts acoustical tile to walls and ceilings of buildings to reduce reflection of sound and to decorate rooms. Measures and marks surface to lay out work, according to blueprints and drawings. Inspects furrings, mechanical mountings, and masonry surface for plumbness and level, using spirit or water level. Nails or screws molding to wall to support and seal joint between ceiling tile and wall. Scribes and cuts edges of tile to fit wall where wall molding is not specified. (1) Applies cement to back of tile and presses tile into place, alining with layout marks and joints of previously laid tile. (2) Nails channels or wood furring strips to surfaces to provide mounting for tile. Places building paper between tile and furring strip preparatory to application of butt-edge tile. Nails, screws, or staples tile to wooden furring strips. (3) Hangs dry lines (stretched string) to wall molding to guide positioning of main runners. Drives hanger inserts into reinforced concrete ceiling, using power fastening tool, and suspends and bends hanger wires at points touching dry lines. Threads wires through holes in main runners, and cuts and attaches cross supports to suspended runners and wall molding, using snips, clips, and rivet gun. Cuts tiles for fixtures and borders, using keyhole saw, and inserts tiles into supporting framework. May wash concrete surfaces with washing soda and zinc sulfate solution before mounting tile to increase adhesive qualities of surfaces.

860.137-010 CARPENTER-LABOR SUPERVISOR (const.)

Supervises and coordinates activities of workers engaged in supplying materials to workers who construct, erect, install, and repair wooden structures and fixtures. Directs work crew to strip forms and dismantle temporary wooden structures. May supervise workers engaged in pouring concrete into wooden forms. Performs other duties as described under SUPERVISOR (any ind.)

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SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 21 OF 24

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DIRECTIONS:

Evaluate your knowledge by answering True or False to the questions below on a separate sheet of paper.

1. An accoustical carpenter must be able to climb, crawl, and see.
2. A wood boat builder works only outside.
3. A house builder works both inside and out and works under hazardous conditions.
4. A maintenance carpenter requires 2-4 years of special vocational preparation.
5. Code No. 860.381-022 has the title of shipwright.
6. Scaffolding is built by a rough carpenter.
7. A bridge carpenter must be able to detect decay in bridge members by striking with a hammer and listening to the sound.
8. A sider installs exterior doors.

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number
ANSWER KEY

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1. True
2. False
3. True
4. True
5. False
6. True
7. True
8. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

Practice Identification Sheet

On a separate sheet of paper, list the physical demands, working conditions, and specific vocational preparation for the following job fields:

1. Carpenter, maintenance
2. Carpenter, ship
3. House builder
4. Carpenter, rough
5. Form builder

Instructional Resources

Texts

Dictionary of Occupational Titles Fourth Edition, United States Department of Labor, 1977.

Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles, United States Department of Labor, 1981.

Florida Center for Career Development Services, Job Information Sheet Tallahassee, Florida, 1980.

Audiovisual

Carpentry - KC7 - "The Trade of Carpentry", Dorsett Educational Systems Inc., Norman, Oklahoma, 1978.

KNOWLEDGE TEST FOR C | 0 3

duty | task number

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DUTY

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TASK: Identify Employment Opportunities

DIRECTIONS:

Evaluate your knowledge by answering the items below on a separate answer sheet.

DO NOT MARK ON THIS TEST!

The items below are True-False. Circle T if the item is True and F if the item is False.

1. Carpentry is one of the oldest known trades.
2. Many fields of employment are available under the general heading of carpentry.
3. A bridge carpenter is one field of carpentry employment.
4. An aircraft carpenter is one field of carpentry employment.
5. *The Dictionary of Occupational Titles* is one listing of different jobb fields within the trade of carpentry.

Selected Characteristics of Occupations enables us to:

6. Determine the physical demands of a job.
7. Determine the working conditions of a job.
8. Determine the vocational preparation required.
9. Determine local pay scales for a job.

C-03
Answer Key
Identify Employment Opportunities

1. T
2. T
3. T
r. F
5. T
6. T
7. T
8. T
9. F

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C COMPLETING CORE CURRICULUM

TASK: 0 4 Use Safety Practices

PURPOSE:

A carpenter works in many potentially dangerous situations, with tools capable of injuring or even killing the careless or unskilled user. Good safety practices are the most important skills any worker can acquire. This learning guide is designed to help you learn safety rules and develop them into safety practices.

PLEASE DO NOT WRITE IN LEARNING GUIDE

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PERFORMANCE OBJECTIVE:
(include condition, performance, and standard)

GIVEN: access to shop safety rules.

YOU WILL: practice shop safety.

HOW WELL: You must successfully complete the Knowledge Test.

ENABLING OBJECTIVES:

1. Identify general safety practices.
2. Identify fire safety practices.
3. Identify first aid procedures.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

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Enabling objective

Identify general safety practices.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify general safety procedures.	1. a. Text: Basic Carpentry, Chapter 1, Part 1, pages 3-7, "General Safety Procedures." b. Instruction Sheet enclosed, Safety First c. Instruction Sheet enclosed, General Safety Rules d. Instruction Sheet enclosed, Unsafe Electrical Practices e. Instruction Sheet enclosed, Lifting
2. Complete the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

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Safety First

"Delores, what happened to your arm?"

"I broke it at work last week."

"You're kidding. I thought you worked in a law office, not in machine shop."

"Don't laugh. Believe me, a broken arm hurts whether you get it in a factory or an office."

Each year one out of every four workers has an accident that is serious enough to demand a doctor's attention. Such injuries are not only painful; they can also be expensive for the worker, because time away from work almost always means some loss of pay. Yet most of these injuries could have been avoided. The best way to prevent accidents is to be concerned with safety, to obey safety rules, and to know what to do if you discover an unsafe condition or a safety violaton.

One problem is that most people don't think an accident will ever happen to them. That's why they are sometimes careless and ignore safety rules like these:

- TURN OFF ALL MACHINERY BEFORE MAKING REPAIRS OR ADJUSTMENTS.
- WEAR HARD HATS IN THIS AREA.
- DON'T OPERATE CARS OR MACHINERY AFTER TAKING THIS COLD MEDICINE.

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- TURN OFF YOUR CAR ENGINE BEFORE PUMPING GAS.
- DON'T PUT OUT CIGARETTES IN THE TRASH CONTAINERS.
- NO SMOKING!

Part of any job is learning and following safety rules. All workers need to be concerned with careless or unsafe acts, not just people who work in construction or with machinery. For example, office workers can be injured by file cabinets that fall forward when several heavy drawers are pulled out at the same time. Some rules apply to any job, however, such as, "Disconnect electrical equipment by pulling the plug, not the cord."

New workers need to learn the safety rules and special hazards (dangers) of their jobs. They should also find out where the fire extinguishers, fire exits, and the first aid kit are located. It's a good idea to look up and post emergency telephone numbers, too.

An alert worker who sees an unsafe condition or a safety violation can prevent accidents by doing something about it right away. If you find a safety hazard, take action in one or more of these ways:

- try to correct the unsafe condition
- warn others
- tell your supervisor
- tell those who caused the safety violation
- get in touch with your safety officer or repair staff
- check back to be sure the violation has been corrected

Try to correct the unsafe condition. Often you can correct a safety hazard right there on the spot. You can pick up broken glass or tell a beginning worker to put on safety goggles. If you see a slippery spill on the stairs, wipe it up yourself or report it to someone else who will do it. This is the best and fastest way to correct a violation and prevent an accident.

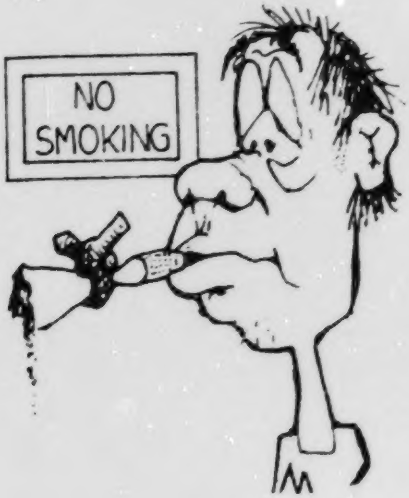
Warn others. Sometimes you cannot correct a dangerous condition right on the spot. You may have to leave the area for tools or call someone else to make repairs. To keep others from being hurt while you are gone, you should warn them of the danger. You may point it out to your co-workers or leave a big sign that everyone coming near the area will see.

Tell your supervisor. Some safety hazards can be corrected only by the person in charge. But even if you have already corrected the situation yourself, it is a good idea to report it to your supervisor. He or she may want to change the way things are done on the job to make sure the violation doesn't happen again. Or he or she may think it's a good time to remind others of the possible dangers of their work.

Tell those who caused the situation. If you see someone breaking a safety rule, or you know who has caused a safety violation, go ahead and ask the person to correct it. He or she will be less likely to make the same mistake again. New workers sometimes break safety rules because they don't know the rules exist. If you don't tell them they may hurt themselves or cause someone else to get hurt.

Get in touch with your safety officer or repair staff. Sometimes safety hazards can be corrected only by specialists or experts. This is especially true with machines and electrical equipment. You should not try to correct hazards involving special equipment unless you know exactly what you are doing. You could end up a victim of the safety hazard you are trying to correct.

Check back to be sure the violation has been corrected. If not, find out why or report the hazard again.



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General Safety Rules

1. Eye protection must be worn at all times when using hand tools, machine tools, chemicals or hot metals equipment (Florida State Law).

2. All guards must be in place when using any piece of equipment (Florida State Law).

3. All power equipment shall be shut off before making any adjustments or change in the operation or arrangement of the machine.

4. All material will be properly and securely clamped down during cutting, forming or joining operations. The hand will not be accepted as a proper clamp.

5. Jewelry (watches, rings, neck chains, etc.) and dangerous clothing (neckties, suit jackets, long sleeve shirts) will be removed or secured when possible and protective clothing will be worn during fastening, forming, and cutting operations.

6. In case of an accident, they must be reported immediately to your instructor so proper action may be taken. ALL ACCIDENTS MUST BE REPORTED!

7. Proper care will be taken to assure the maintenance of tools and machines in a safe working atmosphere. Tools and machines should be checked for safe working conditions before using. Damaged or unsafe equipment should be reported immediately to the instructor.

8. The operator of a machine, tool or test equipment should not engage in conversation or activity with others not related to the oepration of the equipment. The operator must be sure that the safety zone is free of other persons.

9. Never use a piece of equipment until you have been trained in its operation. The instructor must certify that you are capable of operating each piece of equipment.

10. NO running, horseplay, or throwing of tools in any work area. All work areas will be kept clean and free of materials which could cause an accident.

11. Flammable or combustible materials will be stored in a metal container. CAUTION: SAWDUST IS COMBUSTIBLE AND MAY EXPLODE UNDER THE RIGHT CONDITIONS.

12. NEVER adjust a running machine, unless the manufacturer endorses this as a safe practice.

13. Ladders and scaffolding must be secure, unpainted, and inspected daily.

14. When in doubt, DON'T!!! SEE YOUR INSTRUCTOR.

Unsafe Electrical Practices

1. Using ungrounded equipment and portable tools or removing ground connections.

2. Using defective tools or equipment in need of repair.

3. Using equipment which does not meet the approval of the Underwriters Laboratories or other similar agencies.

4. Unsafe cleaning of electrical panels, switch boxes, motors, and other electrical equipment with water or dangerous solvents.

5. Overloading of circuits or overfusing circuits by the use of wrong size or type of fuse.

6. Failure to use suitable safety equipment, gloves, rubber mats, etc. for electrical installation and repair.

7. Failure to de-energize circuits before working on equipment.

8. Improper opening and closing of switches and improper use of electrical equipment.

9. Permitting rubbish, trash, rags, etc., to accumulate near electrical equipment.

10. Work practices which damage motors, insulation, wires, or electrical accessories.

11. Disconnecting of electric cords by pulling on the cords rather than on the plug: stringing extension cords around the shop.

NOTE: Although the above list of unsafe practices is far from complete, you should be aware of the common electrical hazards and unsafe practices and be able to identify and eliminate them.

Lifting

"It's not what you lift but how you lift it." This statement applies to the lifting, lowering, or moving, of heavy equipment or loads. The following procedure is prescribed by the National Safety Council for lifting loads, the reverse procedure is followed for lowering the load.

1. Make a preliminary "heft" to be sure that the load is easily within your lifting capacity. If it is not, secure help.
2. Set your feet solidly and apart, one foot slightly ahead of the other. In some cases, it might be easier to go down almost to the floor on one knee while keeping the other leg at a 90° angle at the knee.
3. Crouch as close to the load as possible with legs bent at about a 90° angle at the knee.
4. Keep the back as straight as possible; it should NOT be arched.
5. Get a firm grip on the object, lifting one end slightly if necessary to get one hand under it. Grip the load so that it will NOT slip while you are lifting and carrying it so that your hands will be protected.
6. To lift the object, straighten your legs, keeping your back erect and your head up.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number PAGE 12 OF 27

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering True or False to to the items below on a separate sheet of paper.

1. Minor injuries do not require an accident report.
2. All power tools should be adjusted while running.
3. Tight, well-fitting clothing should be worn while using equipment.
4. Safety glasses are to be worn when using hand tools or machine tools.
5. Conversations are to be limited to those related to the operation of a machine, while it is being used by an individual.
6. In rush situations, a screwdriver may be tossed from one individual to another.
7. A piece of equipment which has no ground plug is unsafe.
8. A cord may be safely unplugged only by pulling on the plug itself.
9. Only run in the work area when in a rush.
10. The back should be erect with head up when lifting.

Now check your answers with the Answer Key.

SELF-CHECK FOR ENABLING OBJECTIVE 1 number
ANSWER KEY

PAGE 13 OF 27

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

1. False
2. False
3. True
4. True
5. True
6. False
7. True
8. True
9. False
10. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 2 number

PAGE 14 OF 27

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify fire safety practices.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Read Resource No. 1 to identify causes of fires.	1. Instruction Sheet enclosed, Causes of Fire
2. Read Resource No. 2 to determine what to do in case of fire.	2. Instruction Sheet enclosed, What To Do In Case of Fire
3. Tour your shop to determine the location of each fire alarm and fire extinguisher and main electric disconnect. Evaluate your knowledge by using the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 3.	

Causes of Fire

CARDINAL RULE -- NEVER SMOKE IN A WOODWORKING SHOP!!!

Because the nature of school work requires the use of fire, heat, and flammable or combustible materials, there are numerous sources from which a flame may originate. The auto shop, where several different processes and materials are in use, is probably more vulnerable to fire hazards than some other shops you may have worked in. Attention should be called to the following factors when planning for fire prevention:

GAS

Gas is used extensively in school shops as the fuel for brazing, heat treating, soldering, and melting furnaces. Gas equipment may leak or gas may escape because of faulty ignition in the appliance. Frequent inspection and the use of safety pilots and cut-off valves is essential where gas is in use. Special instruction must be given to students before they are permitted to light gas fired torches or appliances.

HOUSEKEEPING

Housekeeping is closely associated with fire protection. Flammable and combustible materials need to be stored in the proper place and manner. Rubbish must not be allowed to accumulate on floors, in corners, or in other areas. Waste materials should be removed daily. Oil accumulation on floors, oil soaked rags or porous floors may ignite if contacted by flame, sparks or sufficient heat.

ELECTRICAL EQUIPMENT

Electrical devices and equipment which are improperly installed, worn, old, or poorly maintained may cause a fire. A short circuit arc may produce sufficient heat to ignite flammable materials.

MATCHES AND SMOKING

Common causes of fire in industrial plants which should be controlled in the school situation are matches and smoking. Smoking should be no problem in most school shops, since students are usually not allowed this privilege. Matches present a different problem because they are used and carried by students. Only safety matches should be allowed in the shop, and, whenever torches are to be lit, the safety, flint, or scratch-type lighter should always be used.

SPONTANEOUS IGNITION

This form of ignition perhaps has been more common in school shops than in industry, partially due to lack of understanding by students and to the fact that combustibles are often left in one location for considerable lengths of time, such as over weekends or holidays. Oily or paint soaked rags and clothing left in student lockers are probably the greatest hazard. Other sources contributing to this hazard are rubbish and accumulation of dust, lint, and oil in duct work and flues. Safety metal containers with a self closing lid must be used for the storage of oily or paint filled waste and rags.

What To Do In Case Of Fire

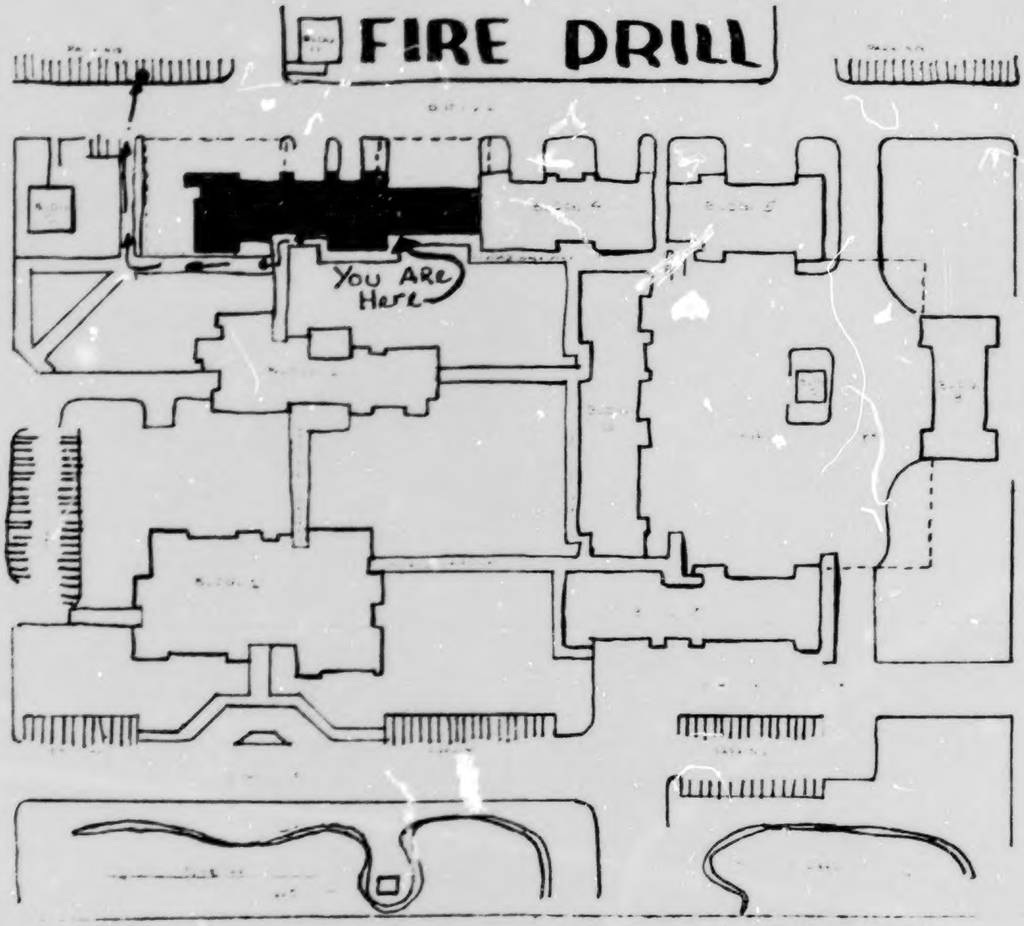
1. Activate fire alarm.

2. If possible, turn-off main electric, and disconnect machinery (in this order, as most machines have magnetic switches and will not re-start after an electric disruption). This is a safety measure to prevent electric shock.

3. If the fire seems combatible with a fire extinguisher, follow the directions printed on the extinguisher.

4. If evacuation becomes necessary or if the fire alarm sounds, at any time, leave the building in a quiet, orderly manner, in accordance with the map on the following page.

5. Memorize the route shown on that map.


FIRE DRILL
You ARE Here

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DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. Smoking is a safe practice in a wood working shop.
2. The fire alarm should be our first concern, in case of fire.
3. Probably the greatest fire hazard in a school shop is oil soaked clothing left in lockers.
4. The main electric disconnect is turned off to prevent danger of electric shock.
5. We have an orderly method of evacuation given on a fire-drill map.

Now check your answers with the Answer Key.

1. False
2. True
3. True
4. True
5. True

ll of your answers should agree with the answers on the Answer Key. f you missed any, go back and repeat one or more of the Learning ctivities for this Enabling Objective.

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 3 number

PAGE 21 OF 27

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

Enabling objective

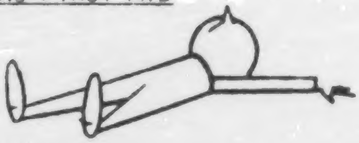
Identify first aid procedures.

PROCEDURE

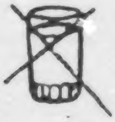
LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify first aid procedures.	1. a. Instruction Sheet enclosed, Directions for Giving First Aid b. Films: "Physical Shock, Burns and Scalds, Artificial Respiration, Control Bleeding", United States Department of Interior, Bureau of Mines, Washington, D.C.
2. Use Resource No. 2 to identify first aid procedures peculiar to the eyes.	2. Instruction Sheet enclsoed, First Aid For Eye Emergencies
3. Use Resource No. 3 to identify the location and contents of the first aid kit.	3. Instruction Sheet enclosed, First Aid Kit -- Contents and Location
4. Complete the Self-Check.	4. Self-Check enclosed.
5. When you think you can attain this task, take the Knowledge Test.	5. Knowledge Test

DIRECTIONS FOR GIVING FIRST AID

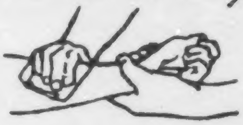
KEEP THE INJURED PERSON LYING DOWN.



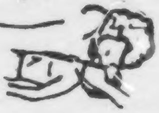
DO NOT GIVE LIQUIDS TO THE UNCONSCIOUS.



CONTROL BLEEDING BY PRESSING ON THE WOUND.

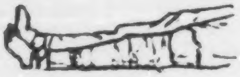


RESTART BREATHING WITH MOUTH-TO-MOUTH ARTIFICAL RESPIRATION.

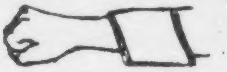


DILUTE SWALLOWED POISIONS.

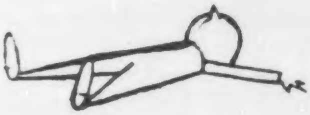
KEEP BROKEN BONES FROM MOVING.



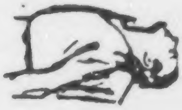
COVER BURNS WITH THICK LAYERS OF CLOTH.



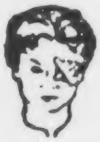
KEEP HEART ATTACK CASES QUIET.



FAINTING: KEEP HEAD LOWERS THAN HEART.



COVER EYE INJURIES WITH GAUZE PAD.



ALWAYS CALL A DOCTOR.

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DUTY

TASK

EN. OBJ.

DEPT.

PROG.

First Aid For Eye Emergencies

Specks in the Eye

DO lift upper eyelid outward and down over the lower lid.

DO let tears wash out speck or particle.

DO-if it doesn't wash out-keep eye closed, bandage lightly and see a doctor.

DO NOT rub eye.

Blows to the eye

DO apply cold compresses immediately, for 15 minutes; again each hour as needed to reduce pain and swelling.

DO-in case of discoloration or "black eye," which could mean internal damage to the eye-see a doctor.

Cuts and Punctures of Eye or Eyelid

DO bandage lightly and see a doctor at once.

DO NOT wash out eye with water.

DO NOT try to remove an object stuck in the eye.

Chemical Burns

Eye damage from chemical burns may be extremely serious, as from alkalis or caustic acids; or less severe, as from chemcial "irritants."

In all cases of eye contact with chemicals:

DO flood the eye with water immediately, continuously and gently, for at least 15 minutes. Hold head under faucet or pour water into the eye using any clean container. Keep eye open as widely as possible during flooding.

Determine location and use of emergency eye wash facilities in the shop.

DO NOT use an eye cup.

DO NOT bandage the eye.

SPRAY CANS are an increasing source of chemical eye injury, compounded by the force of contact. Whether containing caustics or "irritants," they must be carefully used and kept away from children.

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First Aid Kit -- Contents and Location

1. A first aid kit is available to this shop, with a minimum of the following contents:

Supplies Recommended for first Aid Cabinets in shop laboratories

Adhesive tape, ½" x 10 yards or paper tape
Airways, plastic, children and adult sizes
Ammonia Capsules ("Vaporale")
Bandage scissors
Cleansing tissue, paper type
Cotton balls, non-sterile in wide mouth covered jar
Cotton-tip applicators in glass covered jar
Gauze bandages, 1" x 10 yards, 2" x 10 yards
Paper cups
Soap, preferably liquid
Safety pins
Steripads, 100, 2" x 2"
Thermometers, oral
Tongue blades in covered jar or tongue depressor
Triangular bandage

Attain a general knowledge of these contents.

2. Ask your instructor for the location of this kit, in case of emergency. Memorize the location.

SELF-CKECK FOR ENABLING OBJECTIVE 3 number PAGE 25 OF 27

DUTY
TASK
EN. OBJ.
DEPT.
PROG.

DIRECTIONS:

Evaluate your knowledge by answering the items below on a separate sheet of paper.

1. An injured person should be made to walk as soon as possible after an injury.
2. An injured person should be kept lying down.
3. Our shop has an emergency eye wash station.
4. Our shop has a first aid kit.
5. Do not remove an object stuck in the eye.
6. If punctured, do not wash an eye out with water.

Now check your answers with the Answer Key.

1. False
2. True
3. True
4. True
5. True
6. True

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Activities for this Enabling Objective.

KNOWLEDGE TEST FOR C | 0 4

duty | task number

PAGE 1 OF 2

TASK Use Safety Practices

DUTY

TASK

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

DO NOT MARK ON THIS TEST!

1. Tools should not be thrown.

2. Eye protection should be worn at all times when using hand or power tools.

3. Guards should be kept in place on tools.

4. Tools should be kept sharp.

5. Generally, tools should be shut off for adjustment.

6. Jewelry should be worn in the shop.

7. Only report serious accidents.

8. Talking should be limited to the present duty, when in shop.

9. Scaffolding and ladders should be painted.

0. One should never smoke in a wood-working shop.

1. One should run to safety when a fire alarm sounds.

2. Each student should know where the main disconnect is located.

3. Injured persons should be kept lying down.

4. Broken bones should be immobilized as soon as possible.

5. Do not give liquids to the unconscious.

6. Bleeding can be controlled, in most cases, by pressure on the wound.

7. Black eyes should be examined by a doctor.

8. In case of eye contact with chemicals, the eye should be washed out as soon as possible.

KNOWLEDGE TEST FOR C 0 4

CONTINUED duty task number PAGE 2 OF 2

DUTY TASK DEPT. PROG.

19. Oily or greasy clothing should be stored in your locker.

20. Only the electric tools with Underwriters Laboratory approved grounding should be used.

C-04

Answer Key

Use Safety Practices

1. T
2. T
3. T
4. T
5. T
6. F
7. F
8. T
9. F
10. T
11. F
12. T
13. T
14. T
15. T
16. T
17. T
18. T
19. F
20. T

STUDENT LEARNING GUIDE

THE SCHOOL BOARD
OF PALM BEACH COUNTY, FLORIDA

PROGRAM: CARPENTRY

DUTY: C Completing Core Curriculum

TASK: 1 9 Use Radial Arm Saws

PURPOSE:

The radial arm saw is a very versatile tool. It may be used as a cut-off saw or for ripping, dadoing, grooving, and many other cuts. Many of these operations can be performed more easily on the radial arm saw than on any other tool. It is somewhat of a dangerous tool, however, and requires both knowledge and skill for efficient operation. This Learning Guide will assist you in acquiring both the knowledge and skill necessary for safe operation of the tool.

DUTY
TASK
PREREQ.
DEPT.
PROG.
REVISED

PLEASE DO NOT WRITE IN LEARNING GUIDE

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OBJECTIVES PAGE 3 OF 17

DUTY

TASK

DEPT.

PROG.

PERFORMANCE OBJECTIVE:
(Include condition, performance, and standard)

GIVEN: access to a radial arm saw and resource material.

YOU WILL: use radial arm saws.

HOW WELL: You must successfully complete the Knowledge Test. Your performance will be assessed by your instructor using the Performance Test.

ENABLING OBJECTIVES:

1. Identify safe operating practices.
2. Identify common operations of the radial arm saw.
3. Practice using the radial arm saw.

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LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 4 OF 17

Enabling objective:

Identify safe operating practices.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to identify radial arm saw safety practices.	1. Instruction Sheet enclosed, Radial Arm Saw Safety Practices
2. Use Resource No. 2 to identify component parts of a radial arm saw.	2. Instruction Sheet enclosed, Radial Arm Saw Components
3. Complete the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Radial Arm Saw Safety Practices

1. Always keep the safety guard and the anti-kick device in position.
2. Keep your hand at least 4" (102 mm) from the blade.
3. Always check that the guard is adjusted properly for each cut.
4. Be sure the saw blade is back against the stop before turning on power.
5. Stock must be held firmly on the table and against the fence for all crosscutting operations. The end of long board must be supported level with the table.
6. When crosscutting, hold the stock with your left hand and pull the saw with your right hand.
7. Do not cross your arm while crosscutting.
8. Always return the saw to the rear of the table after completing a crosscut or miter cut. Never remove stock from the table until the saw has been returned.
9. For ripping, be sure the blade is rotating upwards toward you. Use anti-kick back device to hold work firmly against the table. Feed the stock from the end opposite the anti-kick device.
10. Be sure the power is off and the saw is not rotating before making any adjustment.
11. Allow the saw to reach full speed before making a cut.
12. Do not leave the machine before the blade has stopped.
13. Keep the table clean and free of scrap pieces and excessive amounts of sawdust. Do not attempt to clean off table while the saw is running.
14. Use holding stick when cutting small pieces.
15. Do not attempt to cut while the saw is coasting.
16. Cut only one piece of stock at a time.
17. Disconnect the power before changing a blade or other cutter.

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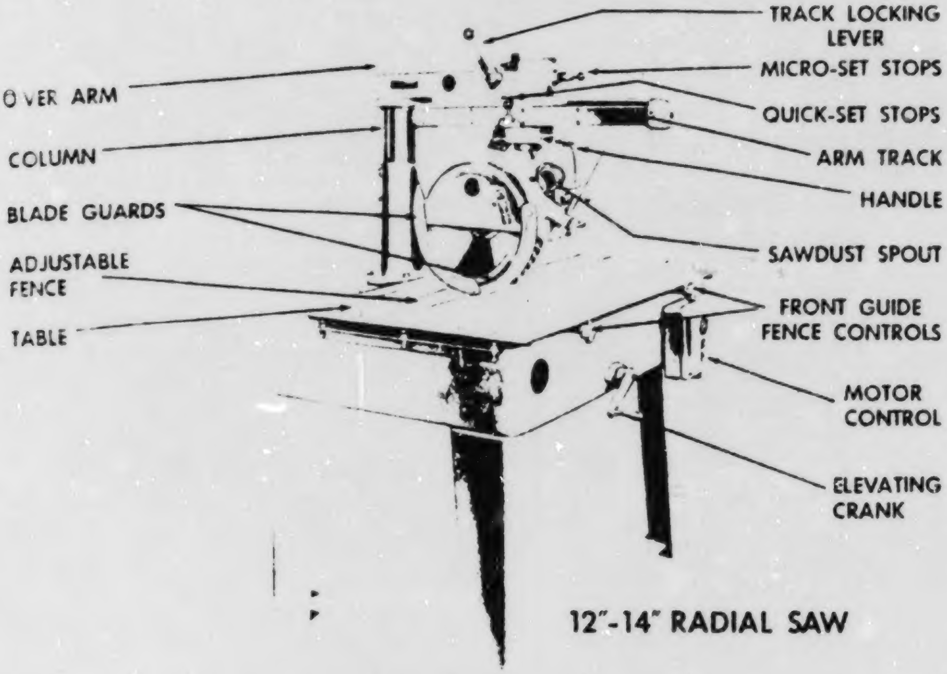
Radial Arm Saw Components

These are the parts of a radial arm saw. This drawing is of the same type of saw in our shop. Learn these parts and be able to identify them an both a drawing and the shop saw.


TRACK LOCKING LEVER
MICRO-SET STOPS
OVER ARM
QUICK-SET STOPS
COLUMN
ARM TRACK
BLADE GUARDS
HANDLE
SAWDUST SPOUT
ADJUSTABLE FENCE
FRONT GUIDE FENCE CONTROLS
TABLE
MOTOR CONTROL
ELEVATING CRANK

12"-14" RADIAL SAW

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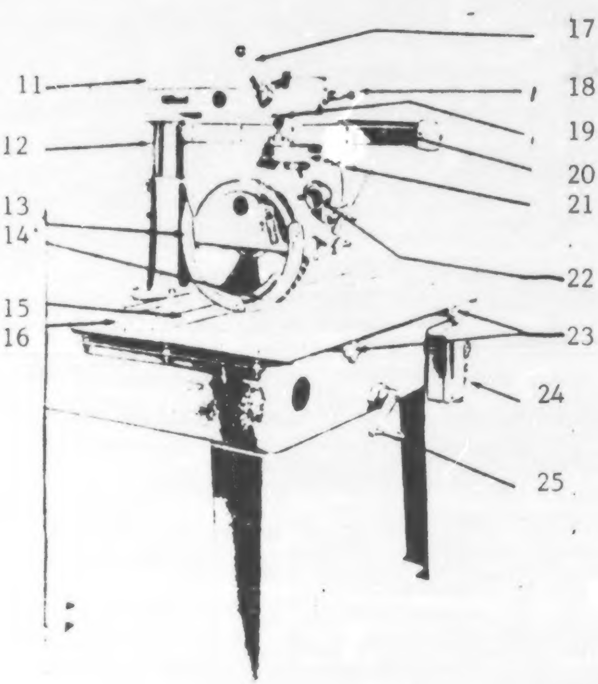
DIRECTIONS:
Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. The guard should be adjusted properly for each cut.
2. Keep hand at least 2" from the blade.
3. Before turning on the power, be sure the saw blade is back against the stop.
4. When crosscutting the stock should be held with your right hand.
5. Upon completing a crosscut, return the saw to the rear of the table.
6. When ripping, be sure the blade is rotating upwards toward you.
7. When making any adjustment the power should be on and the blade rotating.
8. The saw should reach full speed before making a cut.
9. When cutting small pieces of stock one should use the hand.
10. Cut only one piece of stock at a time.

Evaluate your knowledge by matching the items below using a separate sheet of paper.



A. Table

B. Quick-set stops

C. Column

D. Arm track

E. Adjustable fence

F. Handle

G. Front guide fence controls

H. Over-arm

I. Motor control

J. Tracking lever lock

K. Micro-set stops

L. Elevating crank

M. Sawdust spout

N. Blade guards

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True or False	Multiple Choice
1. True	11. H
2. False	12. C
3. True	13. N
4. False	14. N
5. True	15. E
6. True	16. A
7. False	17. J
8. True	18. K
9. False	19. B
10. True	20. D
	21. F
	22. M
	23. G
	24. Z
	25. L

LEARNING ACTIVITIES FOR ENABLING OBJECTIVE 1

number

PAGE 10 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Identify common operations of the radial arm saw.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. Use Resource No. 1 to to identify radial arm saw operations.	1. Texts: a. Carpentry and Building Construction, Unit 9, "Radial Arm Saw", pages 124-137. b. Woodworking for Industry, Unit 28, "Radial Arm Saw, pages 328-337. c. Woodworking, Tools, Materials, Processes, Unit 31, "Radial Arm Saws", pages 283-297.
2. Complete the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Knowledge Test.	3. Knowledge Test.
4. When you have successfully completed the Knowledge Test, go on to Enabling Objective No. 3.	

SELF-CHECK FOR ENABLING OBJECTIVE 1

number

PAGE 11 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

DIRECTIONS:

Evaluate your knowledge by answering True or False to the items below using a separate sheet of paper.

1. When properly installed the teeth on a radial arm dial saw blade point toward you, at the top of the blade.
2. When properly adjusted, the radial arm saw blade should be about 1/16" above the table top.
3. The anti-kick-back device should be adjusted to clear the top of the stock being cut by about 1/8".
4. A hand clamp or a rabbeted stop block are useful when cutting duplicate length boards.
5. Compound angle cuts are made by adjusting both the angle of the motor and the tracking arm.
6. When ripping on a radial arm saw, stock should be fed into the rotation of the blade.
7. The blade has a tendency to lift the stock during ripping, so the stock should be held down.
8. A dado head may be used to cut dados, grooves, or rabbets.

9. Single arm and arm track are two basic types of radial arm saws.

10. Radial arm saws cut from the top. This is a disadvantage for jobs requiring accurate cutting.

11. It is easier to cut a blind dado on the radial arm saw than on a table saw.

12. Horizontal cutting requires a special type of guard.

True or False

1. True
2. False
3. True
4. True
5. True
6. True
7. True
8. True
9. True
10. False
11. True
12. True

DUTY

TASK

EN. OBJ.

DEPT.

PROG.

Enabling objective:

Practice using radial arm saws.

PROCEDURE

LEARNING ACTIVITIES	RESOURCES
1. See your instructor for a job assignment.	1. Instructor
2. Prepare a Job Plan Sheet for this assignment. Have your instructor check your Job Plan Sheet.	2. Job Plan Sheet.
3. Using Resource No. 3 practice using the radial arm saw.	3. a. Job Plan Sheet. b. Materials c. Radial arm saw
4. Complete the Self-Check.	4. Self-Check enclosed
5. Have your instructor inspect your work.	5. Instructor
6. When you think you can perform this task take the Performance Test.	6. Performance Test.

SELF-CHECK FOR ENABLING OBJECTIVE 2 number PAGE 15 OF 17

DUTY

TASK

EN. OBJ.

DEPT.

PROC.

DIRECTIONS:

Evaluate your work by completing the items below using a separate sheet of paper.
All items should receive a "YES" response.

1. Were safety practices followed at all times?

2. Was the saw set up, according to instructions for the:
    a. cut-off assignment.
    b. ripping assignment.
    c. compound mitre cut.
    d. mitre cut.
    e. rabbet cut.

3. Were blade changing procedures followed?

4. Were major parts of the saw identified?

PERFORMANCE TEST FOR C | 1 | 9

duty task number

PAGE 16 OF 17

DIRECTIONS:

Given access to a work station, materials, and a radial arm saw, you will use a radial arm saw. You will be evaluated for the attainment of this task based upon the items listed below.

PERFORMANCE STANDARDS ALL ITEMS MUST BE MARKED YES FOR ATTAINMENT	YES	NO
1. Were safety practices followed at all times?..................		
2. Was the saw set up, according to instructions for the:		
a. cut-off assignment....................................		
b. ripping assignment....................................		
c. compound mitre cut....................................		
d. mitre cut..		
e. rabbet cut...		
3. Were blade changing procedures followed?.................		
4. Were major parts of the saw identified?...................		

DUTY

TASK

ATTEMPT

STUDENT

DATE

☐ Attained
☐ Not attained

EVALUATOR

DEPT.

PROG.

Instructional Resources

Text

Feirer, J. S., Hutchings, G.R., Carpentry and Building Construction, Bennett Publishing Co., Peoria, IL 1981

Spencer, W. P., Griffiths, S. D., Woodworking, Tools, Materials, Processes, American Technical Publishers, Alsip, IL 1981

Feirer, J. S., Woodworking for Industry, Charles A. Bennett Co., Inc., Peoria, IL 1979

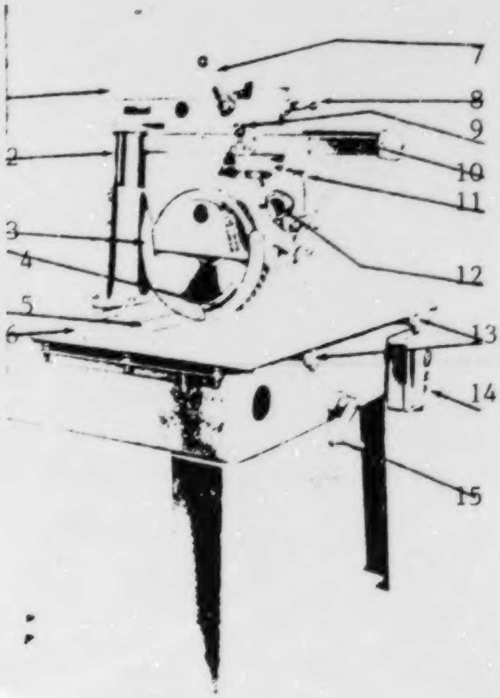
KNOWLEDGE TEST FOR C | 1 9 — duty, task number — PAGE 1 OF 2

DUTY
TASK
DEPT.
PROG.

TASK: Use Radial Arm Saws

DIRECTIONS:

Evaluate your knowledge by matching the items below using a separate sheet of paper.



A. Table

B. Quick-set stops

C. Column

D. Arm track

E. Adjustable fence

F. Handle

G. Front guide fence controls

H. Over arm

I. Motor control

J. Tracking lever lock

K. Micro-set stops

L. Elevating crank

M. Sawdust spout

N. Blade guards

BEST COPY AVAILABLE

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

16. When properly installed, the teeth on a radial arm saw blade point toward you, at the top of the blade.

17. Stock being ripped should be fed into the rotation of the blade.

18. The anti-kick-back device should be adjusted to clear the top of the stock by 1/4".

19. The blade should be adjusted so that it cuts 1/16" below the table top.

20. Hands should be kept at least 4" from the blade.

21. You should never cross your arm while cutting.

22. Always adjust the saw with the power on and motor running.

23. Allow the saw to reach full operating speed before attempting a cut.

24. The table should be kept clear and free of scrap and sawdust.

25. The table should not be cleaned while the saw is in motion.

C-19
Use Radial Arm Saw
Answer Key

Matching

1. H
2. C
3. N
4. N
5. E
6. A
7. J
8. K
9. B
10. D
11. F
12. M
13. G
14. I
15. L

True or False

16. True
17. True
18. False
19. True
20. True
21. True
22. True
23. True
24. True
25. True

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